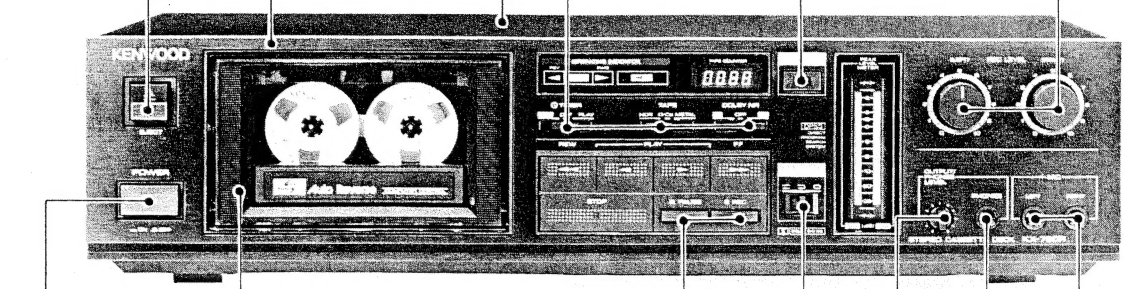
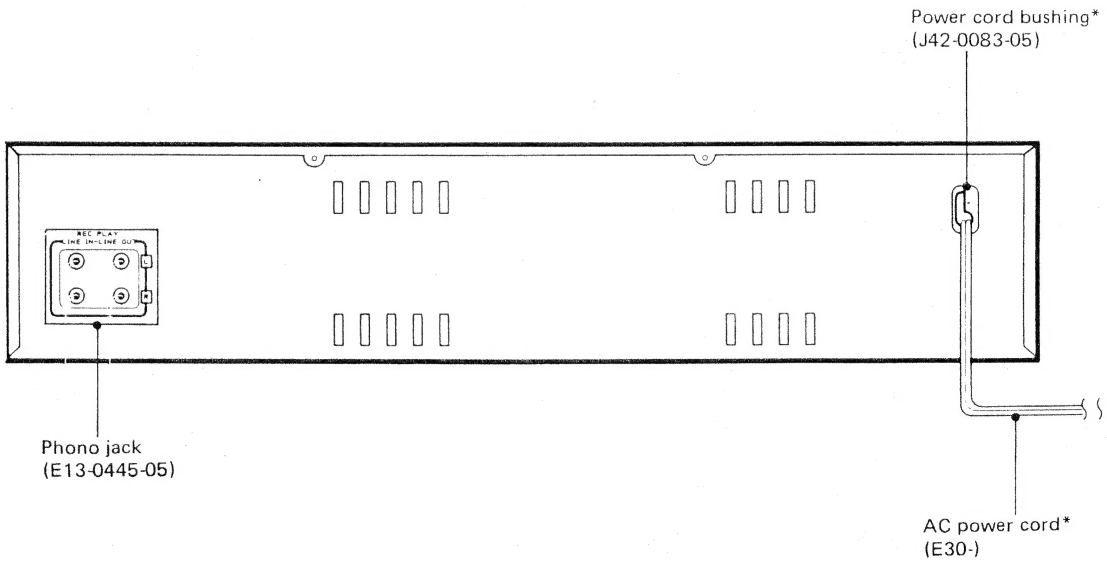
SERVICE MANUAL

KENWOOD

KX-790R

STEREO CASSETTE DECK



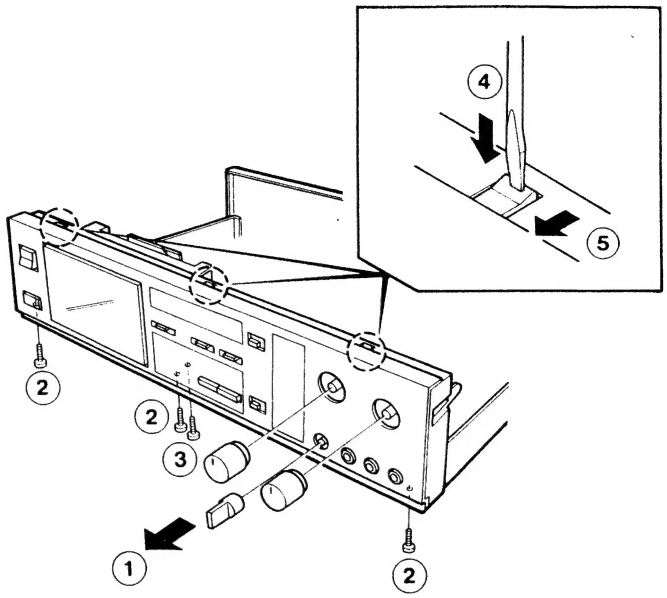


* Refer to parts list on page 40.

DISASSEMBLY FOR REPAIR

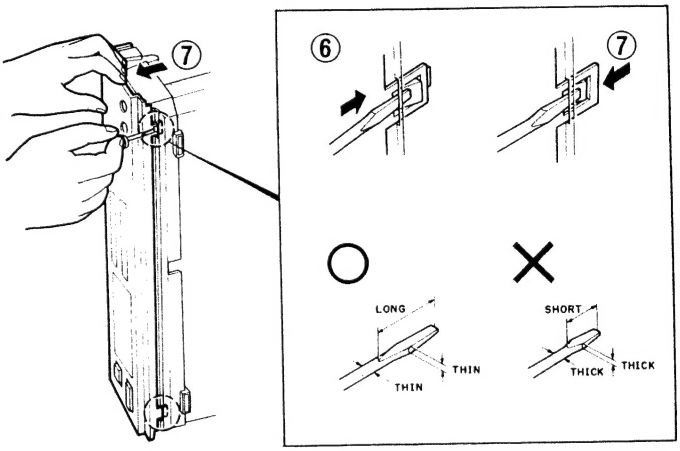
FOR REPAIR OF PCBS ATTACHED TO SUB PANEL

1. Pull out the knobs frontward (①).
2. Remove 3 screws at the bottom side of the front panel and 1 screw retaining the mounting hardware (② , ③).
3. Push the snap down to release the top side of the front panel (④ , ⑤).



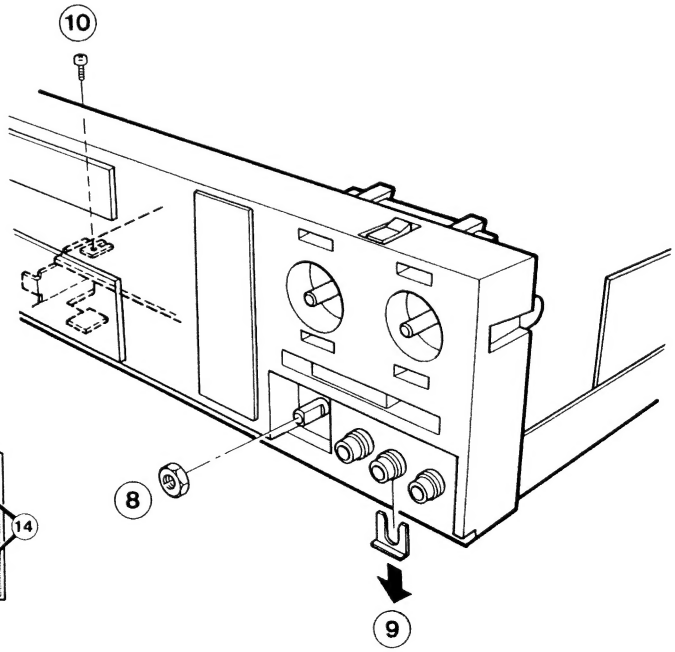
4. By using a flat blade screw driver, push the snap up to release the bottom side of the front panel from the slit and pull the front panel forward (⑥ , ⑦).

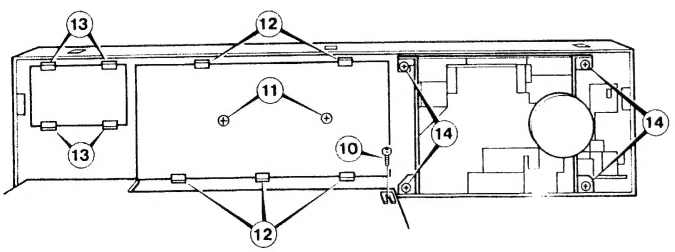
Note : Use a screw driver that satisfies the qualifications shown in the figure to avoid damage to the sub panel slit.



5. Slide out the jack mounting hardware and remove the hexagon nut from the VR axis (⑧ , ⑨), also remove the screw retaining the pcb to the mounting hardware (⑩).

6. Remove 2 screws retaining the SW & DISPLAY pcb and release the pcb from the claws for replacement of components on the pcb (⑪ , ⑫).
7. Release from the claws on the VR pcb for replacement of VRs (⑬).
8. Remove 4 screws from the mechanism assembly for repair of mechanism (⑭).

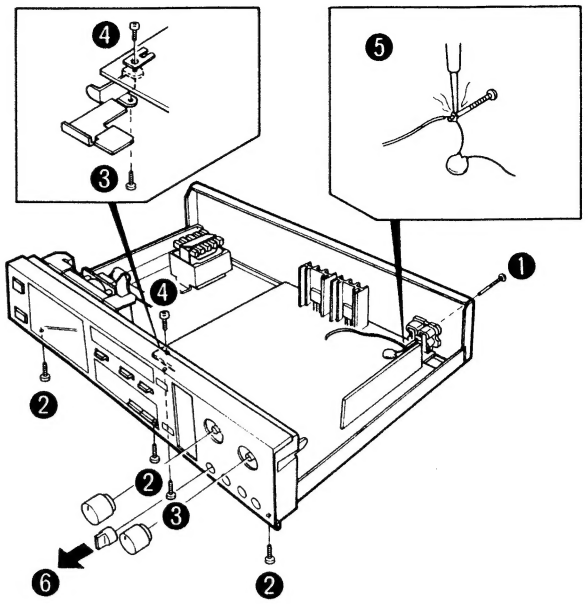




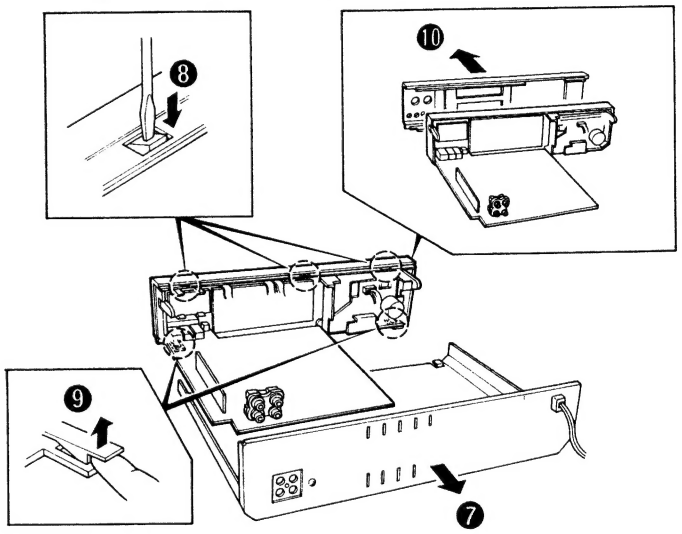
DISASSEMBLY FOR REPAIR

FOR REPAIR OF X26-1090-10 AND OTHERS

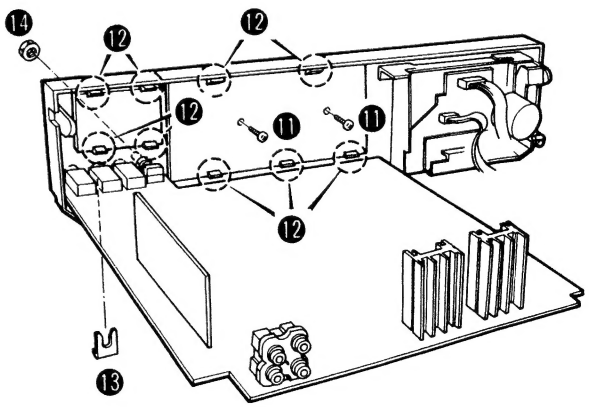
1. Unsolder the GND lead and the capacitor from the GND screw at the phono jack and remove the screw (❶ , ❷).
2. Pull out the knobs frontward (❸).
3. Remove 3 screws at the bottom side of the front panel (❹). Remove screws retaining the mounting hardware from the bottom and from the pcb (❺ , ❻).



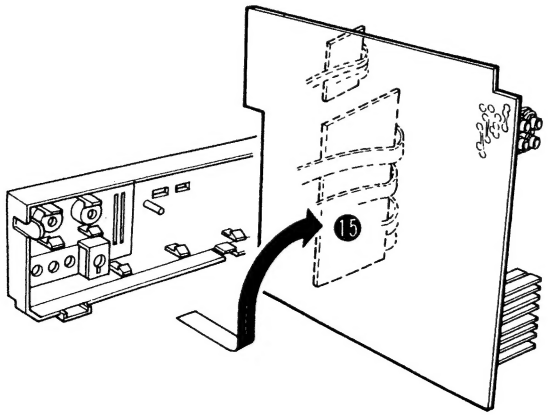
4. Slide the chassis out from the sub panel with the rear panel attached to it (❼).
5. Push the snap down to release the top side of the front panel and by lifting the snap from the bottom release the bottom side of the front panel (❽ , ❾).
6. Remove the front panel (❿).



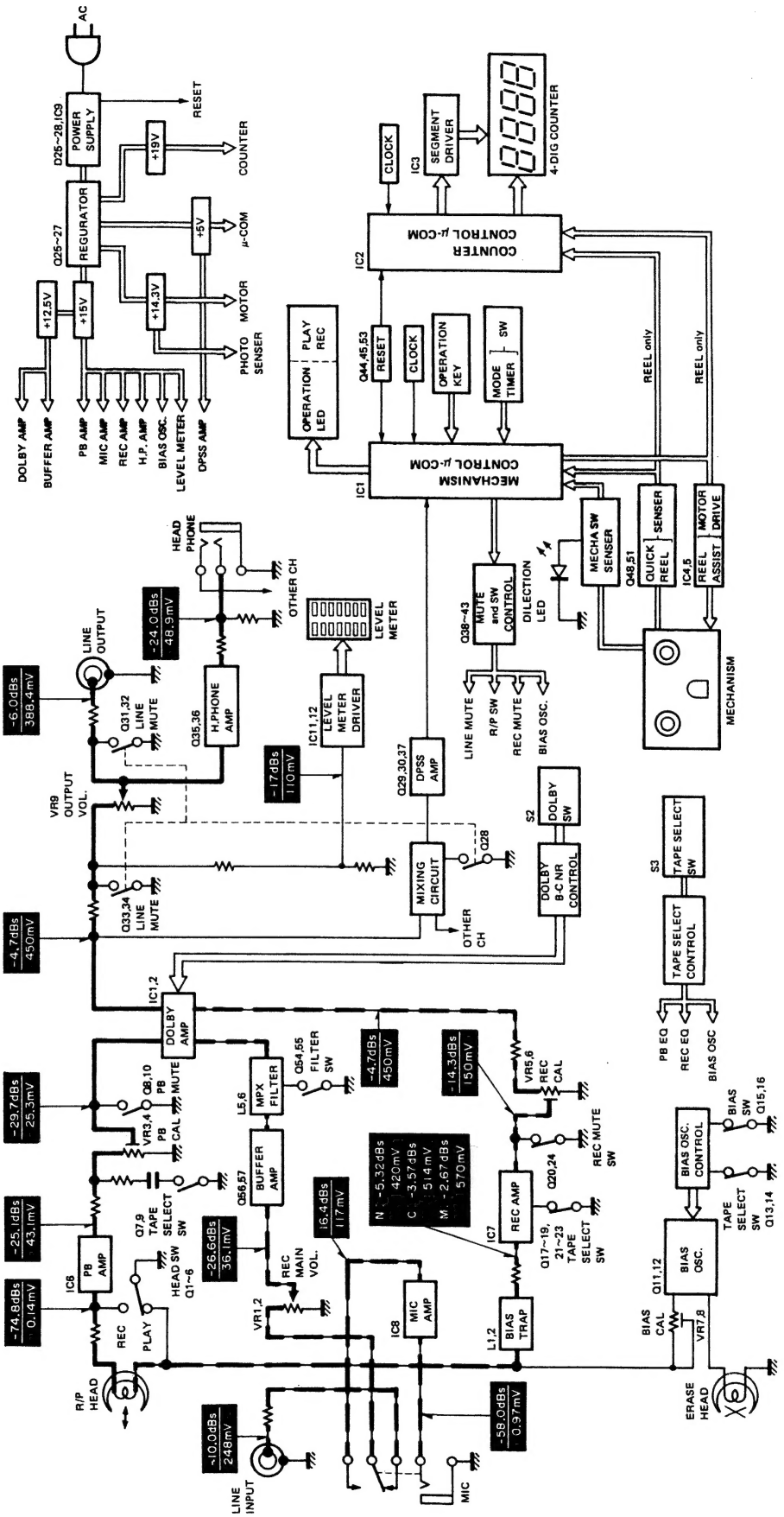
7. Remove 2 screws retaining the SW & DISPLAY pcb and release the pcbs from the claws (⓫ , ⓬).
8. Slide out the jack mounting hardware and remove the hexagon nut from the VR axis (⓭ , ⓮).



9. Turn the pcb (X26-1090-10) as shown in the figure for replacement of components on these pcbs (⓯).



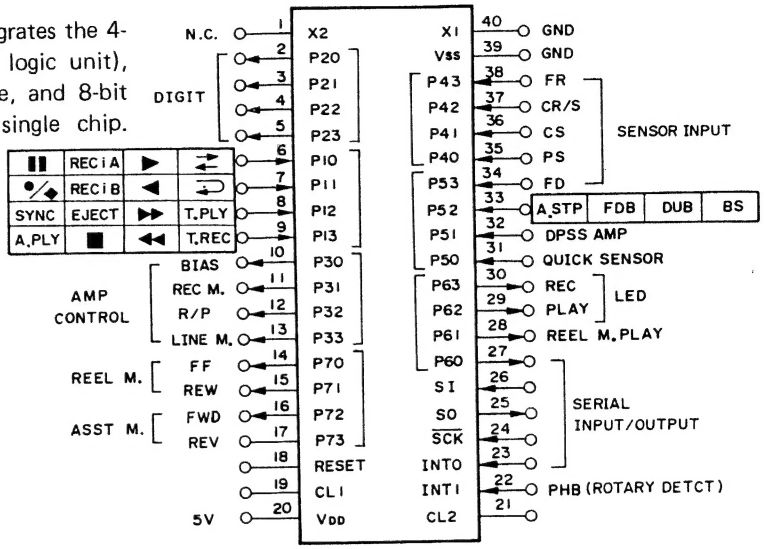
BLOCK LEVEL DIAGRAM

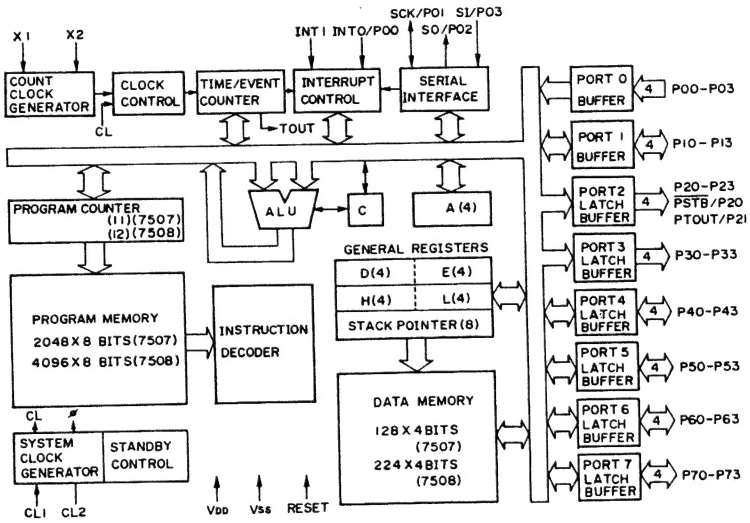


CIRCUIT DESCRIPTION

IC1 μPD7507C One-chip 4-bit microcomputer

μPD7507 is a 4-bit microcomputer which integrates the 4-bit parallel processing ALU (arithmetic and logic unit), ROM, RAM, I/O ports, 8-bit serial interface, and 8-bit programmable timer/event counter into a single chip.





Description of port functions of the microcomputer (slave μPD7507C-099) for the KX-790R

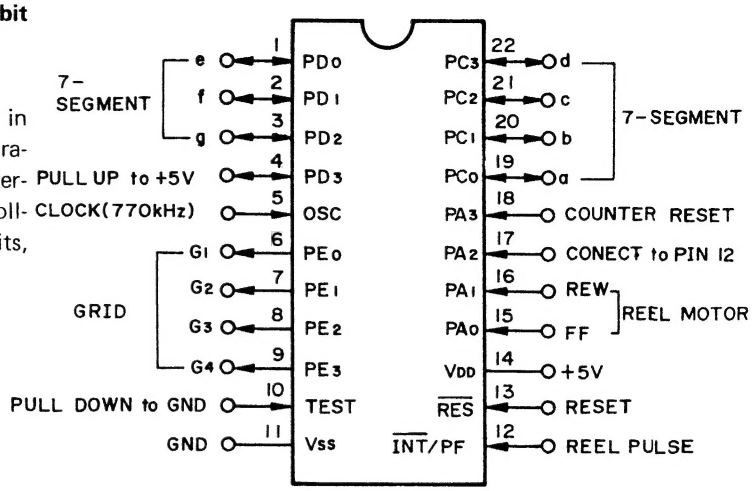
Pin No.	Name	I/O	Functions	
2~5	P20~P23	O	DIGIT	Digit signal outputs.
6~9,33	P10~P13,PS2	I		Key inputs.
10~13	P30~P33	O	AMP	Bias, REC MUTE, REC/PLAY, LINE MUTE outputs.
14,15,28	P70,P71,P61	O	REEL M.	Outputs for controlling the reel motor.
16,17	P72,P73	O	AST.M.	Outputs for controlling the assist motor.
22	PHA	I	PHB	Input for detecting the speed of deck mechanism B.
23	INT0	I		Intercommunication request input.
24	$\overline{SCK}$	I		Serial shift clock input.
25	SO	O		Serial data output.
26	SI	I		Serial data input.
27	P60	O		Shift clock request output.
29,30	P62,P63	O	PLAY,REC	Outputs for the PLAY LED and REC LED.
31	P50	I	QUICK	Quick reverse signal input.
32	P51	I	DPSS	Input for detecting the non-recorded portion.
34~38	P53,P40~P43	I		Inputs for the mechanism position sensor.

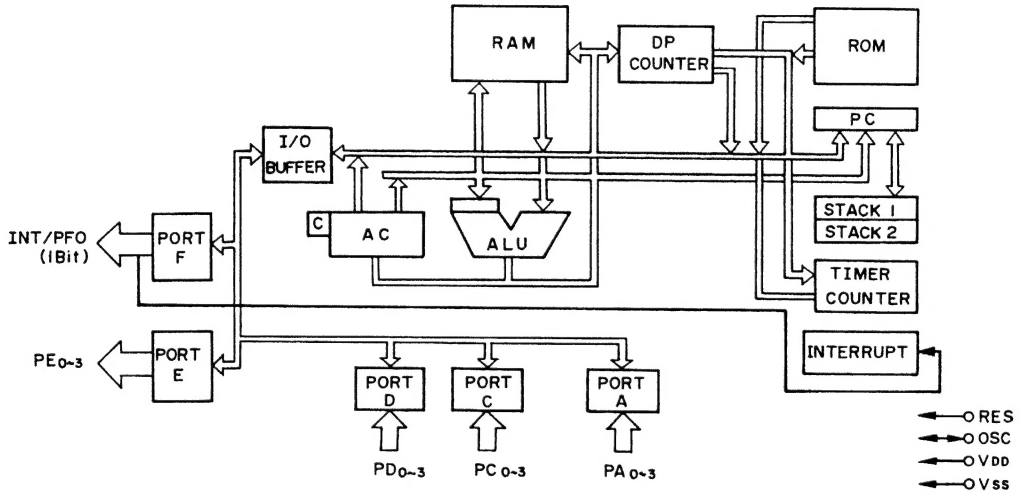
CIRCUIT DESCRIPTION

IC2 LM6417E N-channel E/D MOS LSI One-chip 4-bit microcomputer for controlling

1. Outline

LM6417E is an N-channel MOS 4-bit microcomputer in which ROM, RAM, ALU, I/O ports, timer, clock generator have been integrated into a single chip. The internal memory capcityof this microcomputer for controlling is ROM 1024 bytes (or 1 kbyte), RAM 64 x 4 bits, and the I/O ports have 17pins.



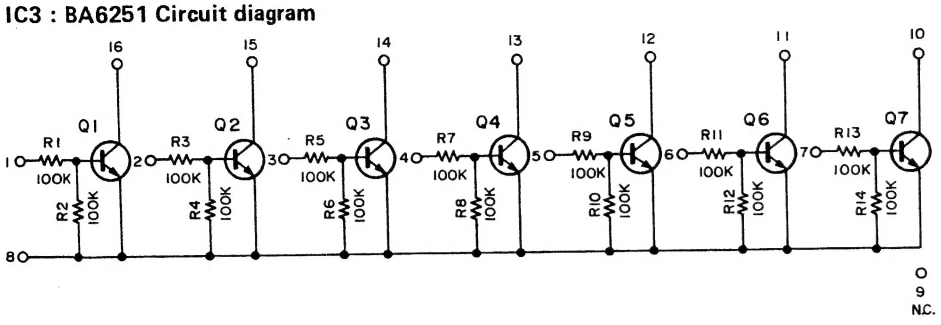


Description of port functions of LM6417E-444 for the KX-790R

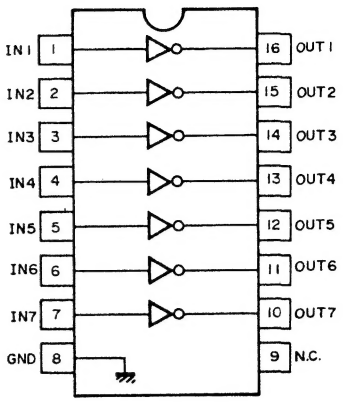
Pin No.	Name	I/O		Functions
1	PD0	O	e	7-segment driver for the FIP 4-digit counter.
2	PD1	O	f	
3	PD2	O	g	
6	PE0	O	G1	Grid driver for the FIP 4-digit counter.
7	PE1	O	G2	
8	PE2	O	G3	
9	PE3	O	G4	
12	INT/PF0	I		Reel disk speed detection pulse input.
15	PA0	I	REW	Mechanism travel direction detect input (detects the output for controlling
16	PA1	I	FF	the reel motor from IC1 μPD7507C-099.)
18	PA3	I		Counter reset key input.
19	PC0	O	a	7-segment driver for the FIP 4-digit counter.
20	PC1	O	b	
21	PC2	O	c	
22	PC3	O	d	

CIRCUIT DESCRIPTION

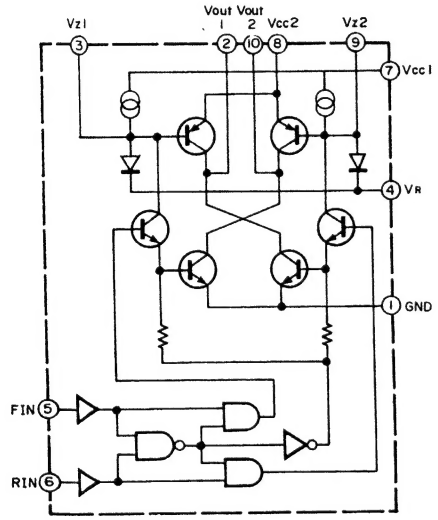
IC3 : BA6251 Circuit diagram



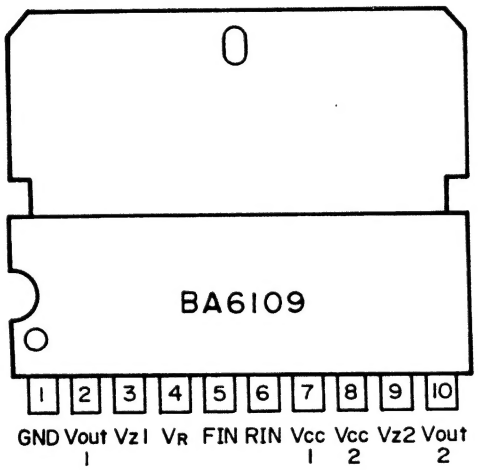
IC3 : BA6251 Pin configuration (Top view)



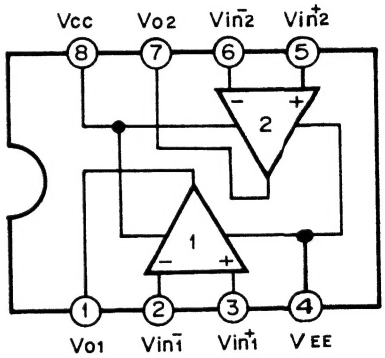
IC4,5 : BA6109 Block diagram



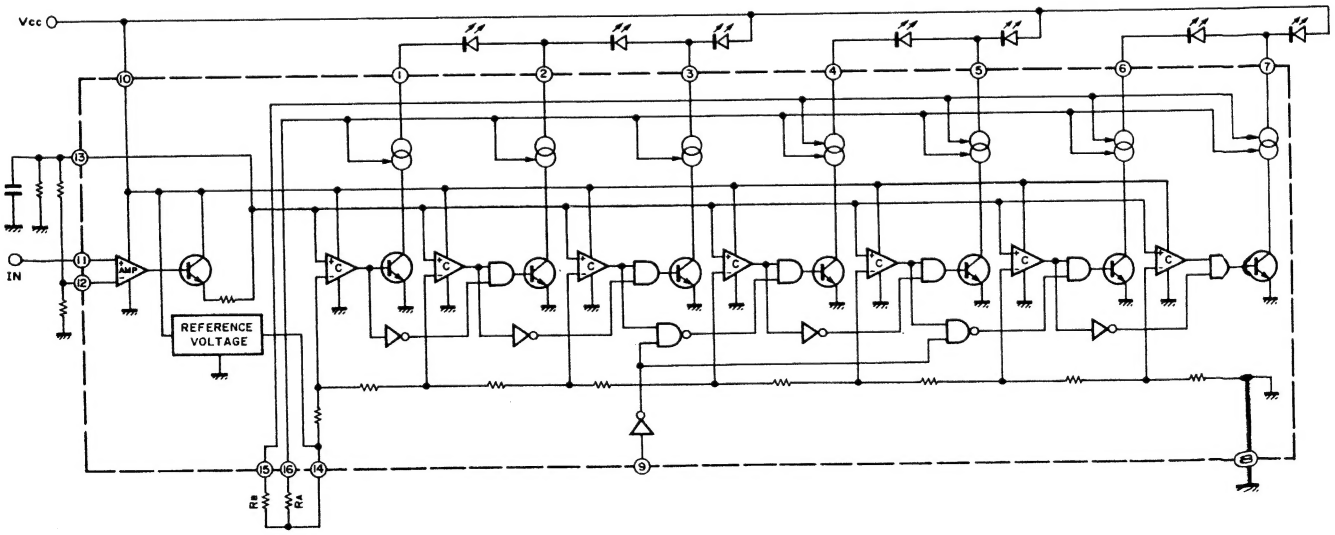
IC4,5 : BA6109 Pin configuration (Top view)



IC7,8 : AN6556 Pin configuration (Top view)



IC11,12 : AN6882 Block diagram



CIRCUIT DESCRIPTION

List of element actions
Name of the PCB: R/P PCB (X26-1090-10)

<table>
<tr><th>Elements</th><th>Applications/functions</th><th>Operation/conditions/compatibility</th></tr>
<tr><td>Q1,Q2,Q4,Q5</td><td>Head select switches</td><td>These switches are controlled by switch controllers consisting of Q38 to Q43 which receive the output from pin 12 (R/P) of mechanism control microcomputer IC1.
During rec & rec pause modes: OFF
During any other mode: ON</td></tr>
<tr><td>Q3,Q6</td><td>Head select switches</td><td>Operate in complement with Q1, Q2, Q4 and Q5. Since these switches are inverted by Q40, they turn ON during rec and rec pause modes and OFF in any other mode.</td></tr>
<tr><td>Q7,Q9</td><td>Playback equalizer select switches</td><td>These switches are controlled by tape selector switch S3. When normal tape (120μS) is used: OFF
When metal/chrome tape (70μs) is used: ON</td></tr>
<tr><td>Q8,Q10</td><td>Playback mute switches</td><td>Like head select switches Q3 and Q6, these switches are controlled by the inverted signal from Q40, and mute the output from the playback equalizer amp, so that bias does not leak to the playback input terminal of the Dolby unit.
During rec & rec pause modes: ON</td></tr>
<tr><td>Q11</td><td>Bias oscillator power supply</td><td>The signal from pin 10 (BIAS) of IC1 controls bias ON/OFF switches Q15 and Q16, which in turn control Q11.
During REC mode: Pin 10 of IC1 goes low with the result that Q16 turns off and Q15 turns on.</td></tr>
<tr><td>Q12</td><td>Bias oscillator coil driver</td><td>This transistor drives the primary winding of bias oscillator transformer L7.</td></tr>
<tr><td>Q13,Q14</td><td>Bias oscillator level select switches</td><td>These switches are controlled by tape selector switch S3, function as shown in the table below.
<table>
<tr><th></th><th>Normal</th><th>Chrome</th><th>Metal</th></tr>
<tr><td>Q13</td><td>ON</td><td>OFF</td><td>OFF</td></tr>
<tr><td>Q14</td><td>OFF</td><td>ON</td><td>OFF</td></tr>
</table></td></tr>
<tr><td>Q15,Q16</td><td>Bias ON/OFF switches</td><td>These switches are controlled by the signal from pin 10 (BIAS) of IC1.
<table>
<tr><th></th><th>REC</th><th>Other modes
(including rec pause mode)</th></tr>
<tr><td>Q15</td><td>ON</td><td>OFF</td></tr>
<tr><td>Q16</td><td>OFF</td><td>ON</td></tr>
</table></td></tr>
<tr><td>Q17~Q19,
Q21~Q23</td><td>Recording equalizer select switches</td><td>These switches are controlled by tape selector switch S3.
<table>
<tr><th></th><th>Normal</th><th>Chrome</th><th>Metal</th></tr>
<tr><td>Q17,Q21</td><td>ON</td><td>ON</td><td>OFF</td></tr>
<tr><td>Q18,Q22</td><td>OFF</td><td>ON</td><td>OFF</td></tr>
<tr><td>Q19,Q23</td><td>OFF</td><td>OFF</td><td>ON</td></tr>
</table></td></tr>
<tr><td>Q20,Q24</td><td>REC MUTE switches</td><td>These switches are controlled by the signal from pin 11 ($\overline{\text{REC MUTE}}$) of IC1.
During rec mode only: OFF
During any other mode: ON (including rec pause mode)</td></tr>
<tr><td>Q25</td><td>+19V constant-voltage regulated power supply</td><td>Power supply for the 4-digit, 7-segment counter.</td></tr>
<tr><td>Q26</td><td>+5.6V constant-voltage regulated power supply</td><td>Power supply for ICs 1 and 2 (microcomputer) and DPSS amps (Q29, Q30 and Q37)</td></tr>
<tr><td>Q27</td><td>+14.3V constant-voltage regulated power supply</td><td>Power supply for driving the motor and the photo-sensor.</td></tr>
<tr><td>Q28</td><td>DPSS input sensitivity select switch</td><td>During play, rec, rec pause modes: OFF
During any other mode: ON (including play pause mode)
Pin 13 ($\overline{\text{LINE MUTE}}$) of IC1 outputs a high level signal during the play, rec and rec pause modes as mentioned above, which switches off Q41. As a result, Q28 turns off with the consequence that the bypass filter connected to Q28 becomes conductive and is introduced to the input of DPSS amp Q29, Q30 and Q37, thereby increasing the input sensitivity. Conversely, in other modes, such as DPSS operation modes (cue, review, etc.), a low level signal is output from pin 13 ($\overline{\text{LINE MUTE}}$) of IC1, and turns both Q41 and Q28 on, lowering the input sensitivity.</td></tr>
</table>

CIRCUIT DESCRIPTION

<table>
<tr><th>Elements</th><th>Applications/functions</th><th>Operation/conditions/compatibility</th></tr>
<tr><td>Q29,Q30</td><td>DPSS amplifier</td><td>NPN 2-stage direct-coupled configuration. These amplifiers are coupled with DPSS output switch Q37 in the subsequent stage.</td></tr>
<tr><td>Q31,Q32
Q33,Q34</td><td>LINE OUT and headphone mute switches and meter mute switches</td><td>These switches operate in the same conditions as DPSS input sensitivity select switch Q28 and are controlled by the output from pin 13 ($\overline{\text{LINE MUTE}}$) of IC1.
During play, rec, and rec pause modes: OFF
During other modes: ON (including play pause mode)</td></tr>
<tr><td>Q35,Q36</td><td>Headphone amplifiers</td><td>These amplifiers output in the emitter-follower configuration.</td></tr>
<tr><td>Q37</td><td>DPSS output switch</td><td>This switch is turned on or off by the detection output from 2-stage direct-coupled amplifiers Q29 and Q30 during the DPSS operaiton such as cue, review modes, etc. and the signal detecting the non-recorded portion is input to pin 32 (DPSS) of IC1 from the collector of Q37.
When the non-recorded portion is detected: low
When the already recorded portion is detected: high</td></tr>
<tr><td>Q38,Q39,
Q40,Q43</td><td>REC/PLAY select switch controllers</td><td><table><tr><th></th><th>REC + REC PAUSE</th><th>Other modes</th></tr><tr><td>Q43</td><td>ON</td><td>OFF</td></tr><tr><td>Q40</td><td>ON</td><td>OFF</td></tr><tr><td>Q39</td><td>ON</td><td>OFF</td></tr><tr><td>Q38</td><td>OFF</td><td>ON</td></tr></table>The above operation is controlled by the output from pin 12 (R/P) of IC1, and a high level signal is output from pin 12 during rec & rec pause modes, and a low level signal is output from the same pin during other modes.</td></tr>
<tr><td>Q41</td><td>LINE OUT mute switch controller</td><td>This transistor is controlled by the output from pin 13 (LINE MUTE) of IC1, which is active low. This is off during play, rec, and rec pause modes, and on in other modes (including play pause mode), and on when the power is switched on or off.</td></tr>
<tr><td>Q42</td><td>REC MUTE switch controller</td><td>This transistor is controlled by the output from pin 11 (REC MUTE) of IC1, which is active low. This is off in rec mode, on in other modes and when power is switched on or off.</td></tr>
<tr><td>Q44,Q45,Q53</td><td>Reset</td><td>Refer to "Microcomputer reset circuit" on the separate sheet.</td></tr>
<tr><td>Q46,Q47</td><td>Controllers to regulate the voltages to be applied for driving the reel motor</td><td>These transistors operate under the following conditions on receipt of the output from pin 28 (reel motor play) of IC1.<table><tr><th></th><th>During play and rec modes</th><th>During other modes (including pause mode)</th></tr><tr><td>Output from pin 28 of IC1</td><td>High</td><td>Low</td></tr><tr><td>Q47</td><td>ON</td><td>OFF</td></tr><tr><td>Emitter voltage of Q46</td><td>about 3.6V</td><td>about 6.4V</td></tr></table></td></tr>
<tr><td>Q48</td><td>Quick sensor amp</td><td>This amp turns on or off by the signal from the photo-coupler for the quick sensor. This amp momentarily turns on when the tape shifts from the magnetic coating portion to the leader tape portion at the end of tape. The low level signal is input to pin 31 (QUICK) of IC1 at this time.</td></tr>
<tr><td>Q49,Q50</td><td>Direction LED driver</td><td><table><tr><th></th><th>During forward mode</th><th>During reverse mode</th></tr><tr><td>Position sensor terminal</td><td>High</td><td>Low</td></tr><tr><td>Q49</td><td>ON</td><td>OFF</td></tr><tr><td>Q50</td><td>OFF</td><td>ON</td></tr><tr><td>D48 (LED)</td><td>Comes on</td><td>Goes out</td></tr><tr><td>D50 (LED)</td><td>Goes out</td><td>Comes on</td></tr></table></td></tr>
</table>

CIRCUIT DESCRIPTION

Elements	Applications/fuctions	Operation/conditions/compatibility
Q51	Revolution detection amp	On receipt of the switching signal (5 pulses/revolution) proportional to the speed of the reel puck (the take-up reel in forward mode), this amp generates pulses.
Q52	PLAY LED driver	This transistor turns on or off by the output from pin 29 (PLAY LED) of IC1. During play mode, Q52 turns on, lighting LED D49.
Q54,Q55	MPX filter select switch	This is controlled by Dolby switch S2. It is off when the Dolby switch is off and on when the switch is on.
Q56,Q57	Buffer amp	Emitter-follower output.
Q58	+12.5V constant-voltage regulated power supply	Power supply for the Dolby amp and buffer amp.
IC1	Mechanism controller	Controls the mechanism operation. Refer to the operation and function description of IC1 (μPD7507C-099).
IC2	Counter controller	This IC has functions to drive the FIP 4-digit 7-segment counter, detect the reel puck revolution and detect the mechanism travel direction. Refer to the operation and function description of IC2 (LM6417E-444).
IC3	Transistor array for driving the 7-segment counter	Incorporates emitter-common 7-channel. Refer to the pin connection diagram.
IC4	Assist motor driver	Switches the forward and reverse directions of the assist motor. Refer to the operation and function description of IC4 (BA6109).
IC5	Reel motor driver	Drives the reel motor, and switches between fast forward and rewind modes.
IC6	Playback equalizer amp	Has a gain of Av = 49.8dB (at 315Hz). This IC is also used for the KX-72R, 770R and 727R.
IC8	Recording equalizer amp	IC AN6556 is used which has a higher slew rate.
IC9	3-pin regulator (+15V)	
IC11,IC12	Level meter driver	These are also used for the KX-6XC, 770R.

Reset circuit for the microcomputer

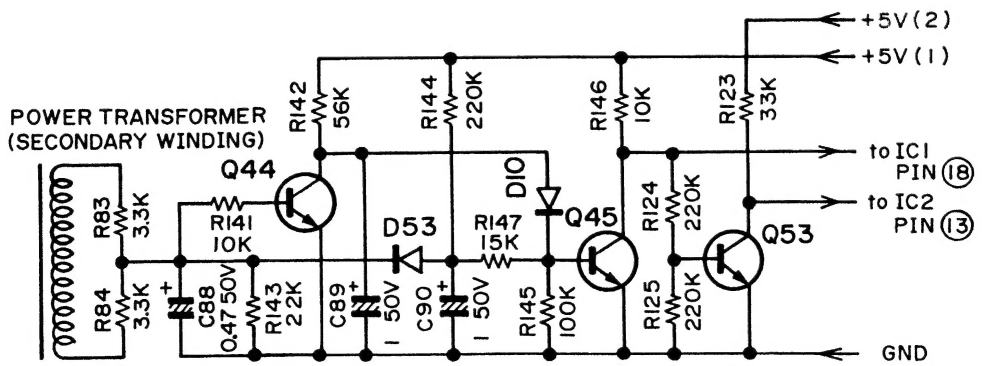
Since IC1 is a CMOS IC (μPD7507C-099) and IC2 is an N-channel MOS IC (LM6417E-444), the reset signal detection mode is opposite in phase (180° out of phase) from each other, i.e., IC1 detects the high-to-low level change whereas IC2 detects the low-to-high level change.

For this reason, the reset signal for IC1 is phase-inverted by Q53, the output of which is coupled with the reset pin of IC2.

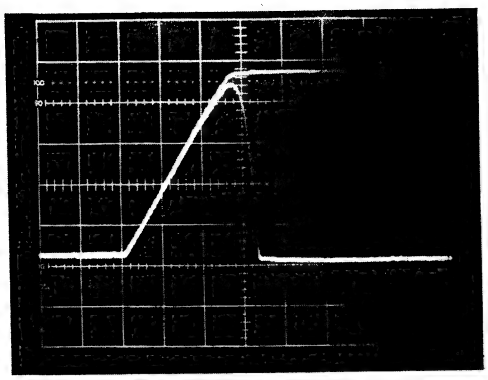
(When the power is on)
Since Q44 does not contribute to the reset operation, the same reset signal as that for the conventional models KX-6XC, 880 and 880SR is developed at the collector of Q45.

(When the power is off)
Immediately after the power is switched off, the base potential of Q45 is discharged through D53 with the result that Q45 turns off and that the collector potential of Q45 reaches +5V. In the case of the KX-790R, so that the mechanism reset is positively performed using the initialize command of the microcomputer when the power is switched off, the +5V potential is retained for some time by storing the charge at C77 (330μF).

For this reason, after Q44 turns off, Q45 turns following the time constant given by R142 times C89 (following the timing delay given by multiplying R142 value by C89 value.) This permits the collector potential of Q45 to shift from high to low, providing the power off reset signal.



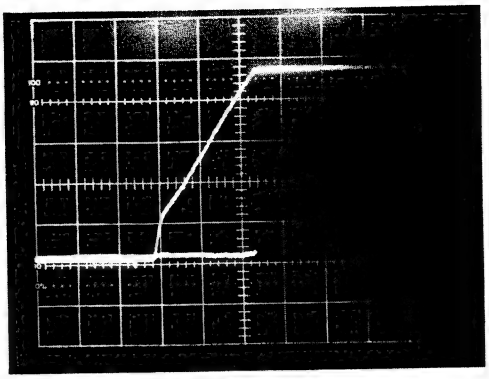
CIRCUIT DESCRIPTION



POWER ON

{IC1 (pin (18)) + 5V (1)}

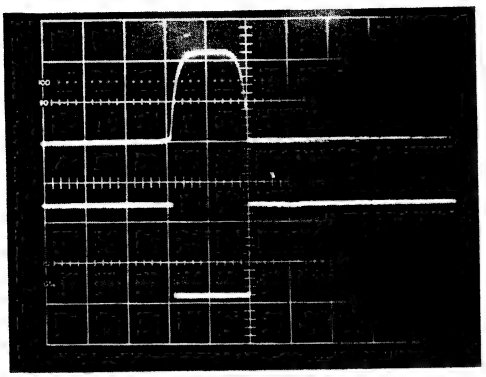
(20ms/DIV 1V/DIV)



POWER ON

{IC2 (pin (13)) + 5V (2)}

(20ms/DIV 1V/DIV)



POWER OFF

IC1 (pin (18))

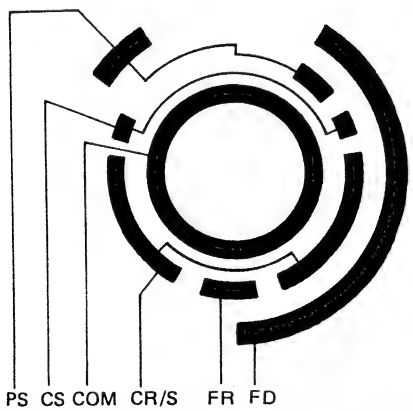
(5ms/DIV 2V/DIV)

IC2 (pin (13))

Mechanism timing chart

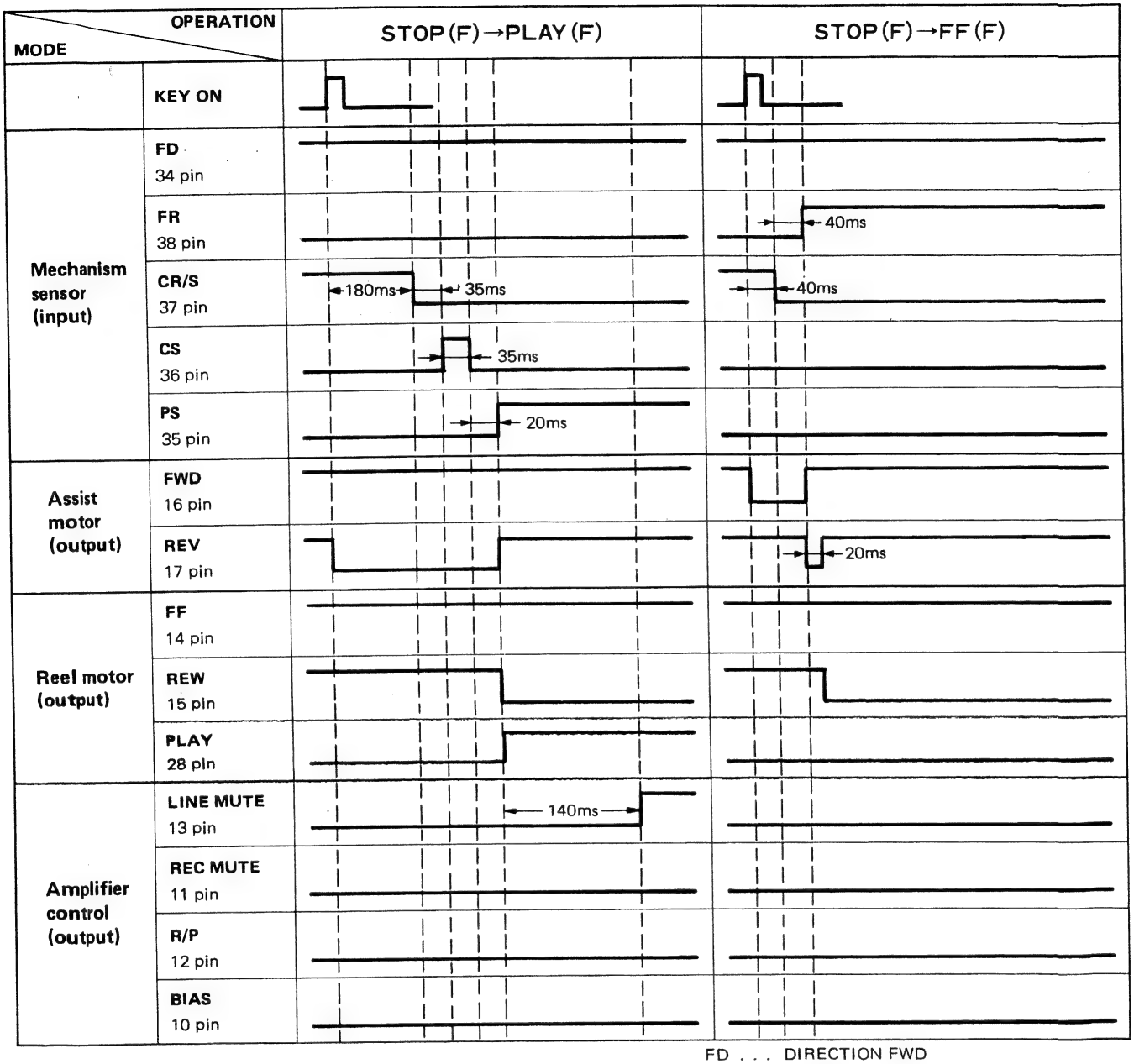
1. Operation
   a. Position sensor
      The switching timing of all operation is controlled by the position sensor.

FD	DIRECTION FORW
FR	FF/REW
CR/S	CUE RETURN/STOP
COM	COMMON
CS	CUE STOP
PS	PLAY STOP



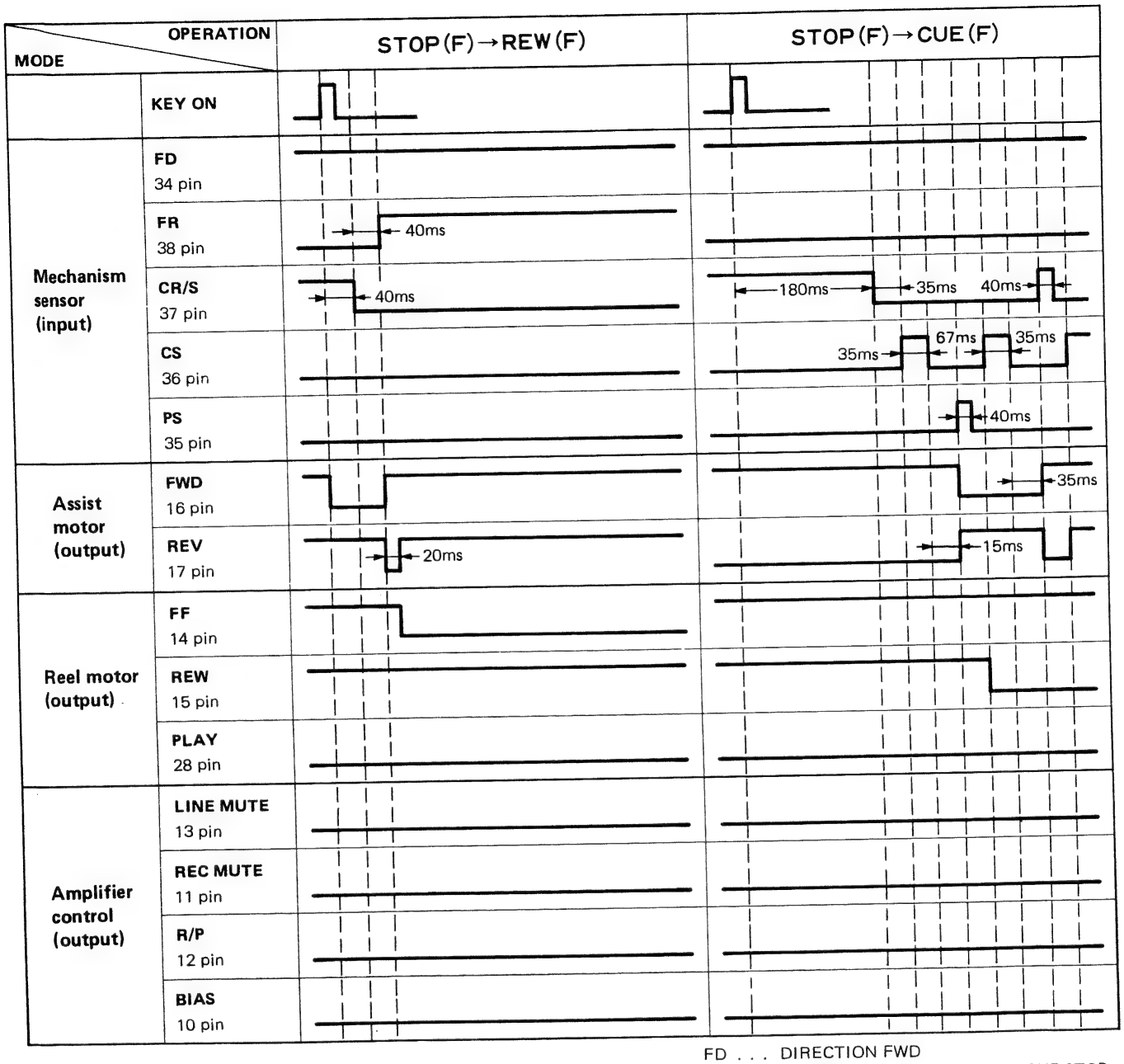
   b. Position detection
      Theoretically speaking, the position is detected in the same way for both the forward and reverse directions. The forward side has the detect pattern (FD) for detecting the direction. By means of this FD patterns, the direction of the assist motor is controlled.
2. Trigger point
   The detect timing of the position sensor is performed by connecting to common. The operation change-over point is illustrated in the timing chart as follows.

CIRCUIT DESCRIPTION



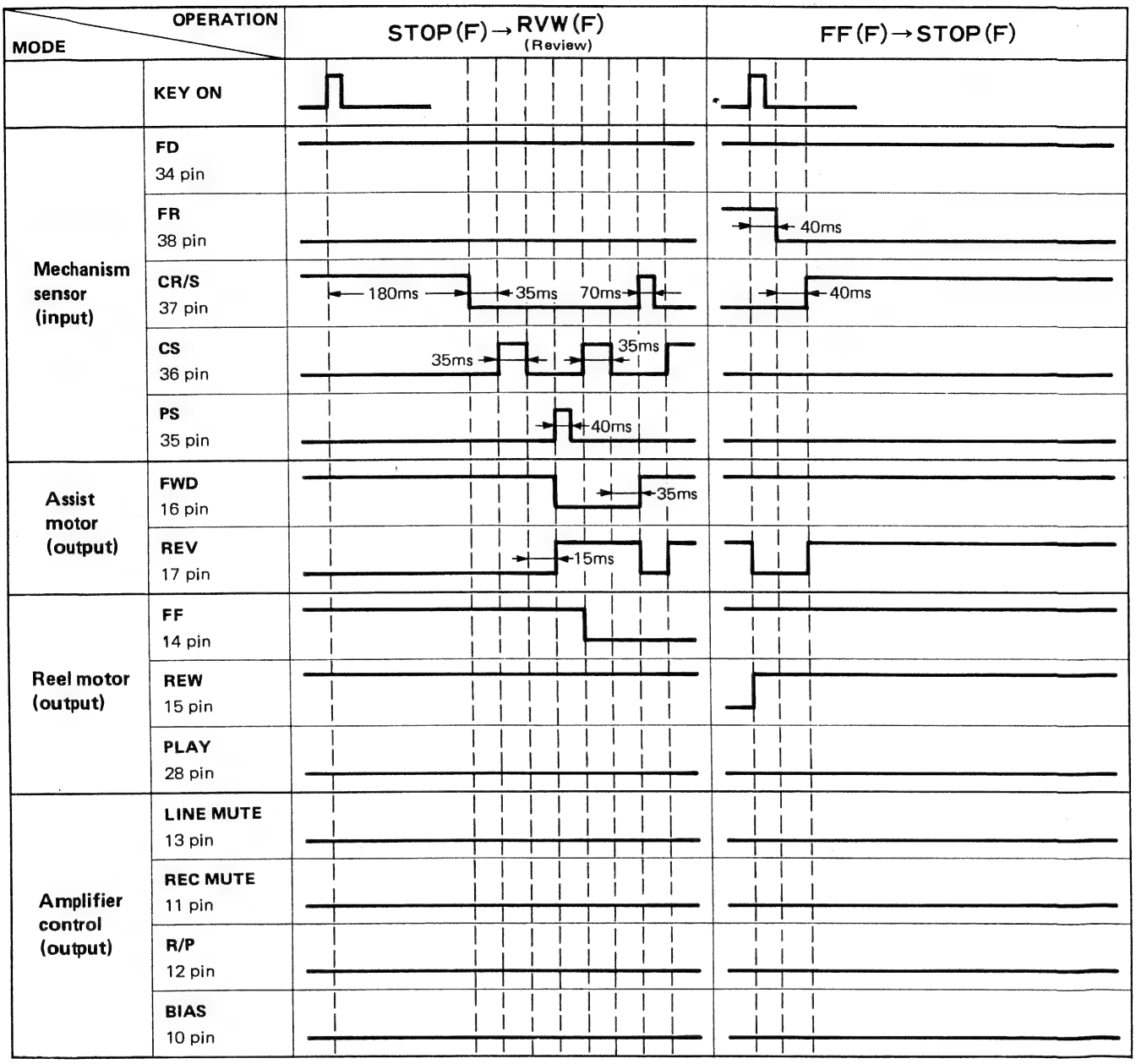
FD . . . DIRECTION FWD
FR . . . FF/REW
CR/S . . CUE RETURN/STOP
CS . . CUE STOP
PS . . PLAY STOP

CIRCUIT DESCRIPTION



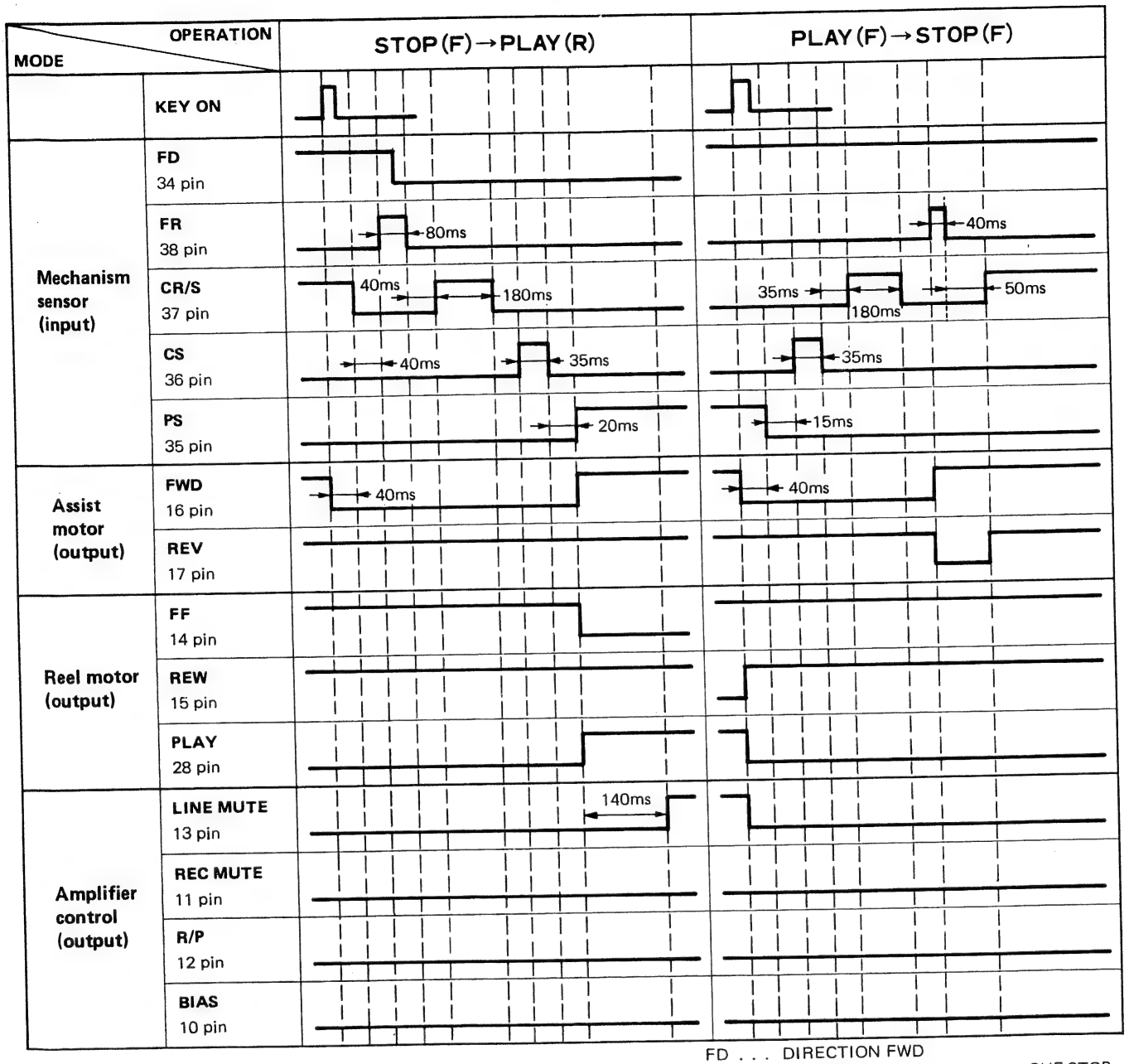
FD . . . DIRECTION FWD
FR . . . FF/REW
CR/S . . CUE RETURN/STOP
CS . . CUE STOP
PS . . PLAY STOP

CIRCUIT DESCRIPTION



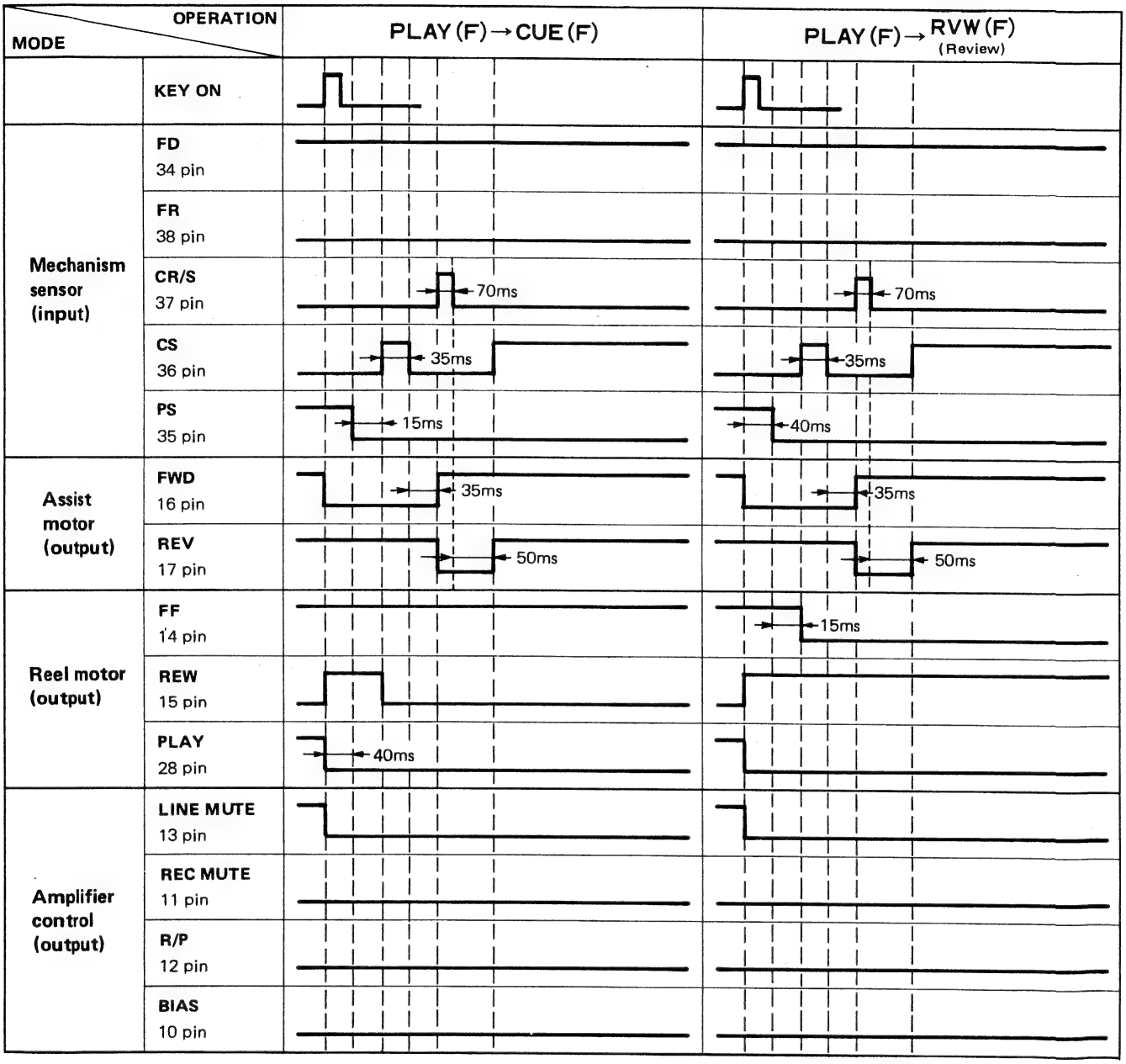
FD . . . DIRECTION FWD
FR . . . FF/REW
CR/S . . CUE RETURN/STOP
CS . . CUE STOP
PS . . PLAY STOP

CIRCUIT DESCRIPTION



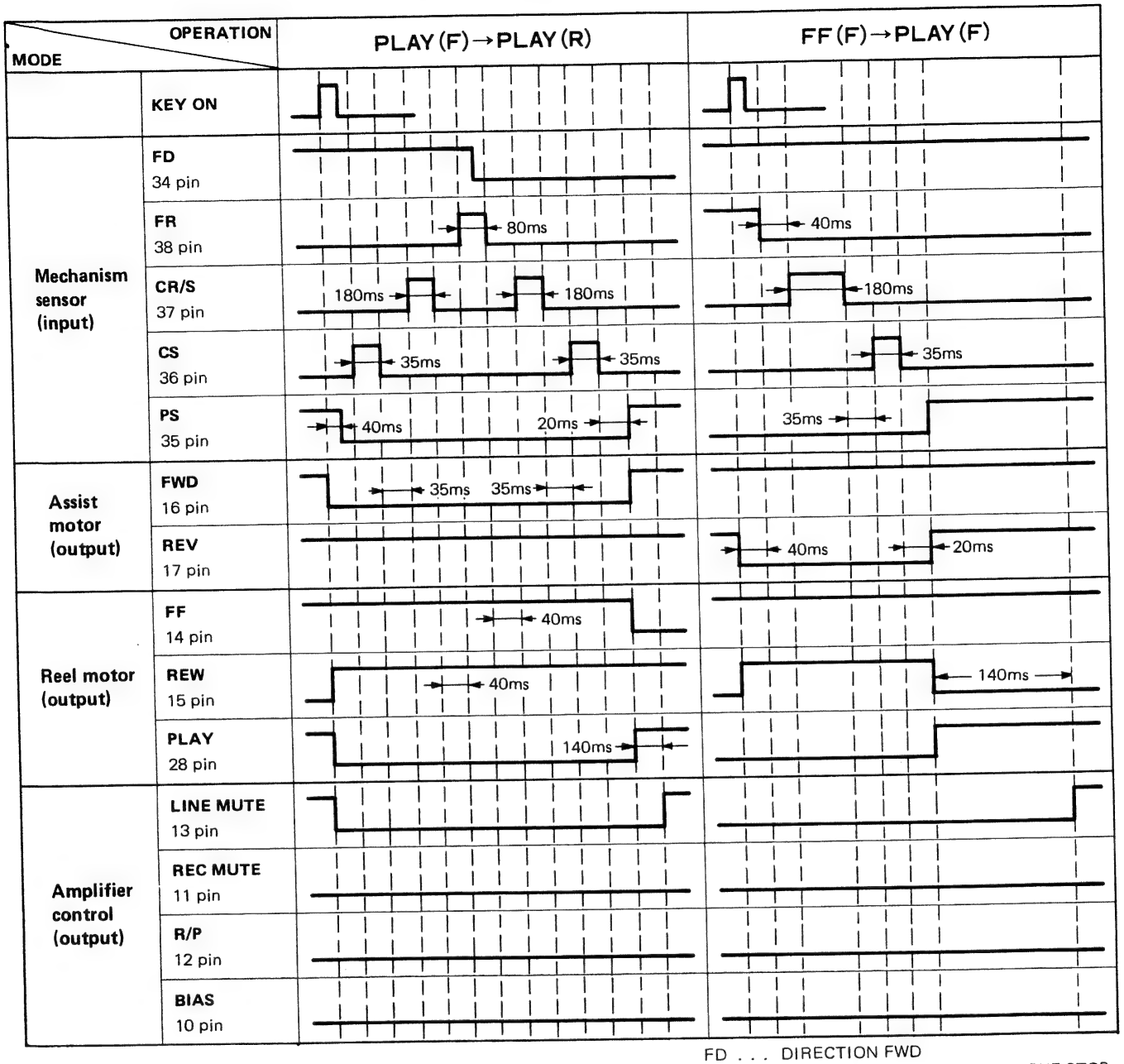
FD . . . DIRECTION FWD
FR . . . FF/REW
CR/S . . CUE RETURN/STOP
CS . . CUE STOP
PS . . PLAY STOP

CIRCUIT DESCRIPTION



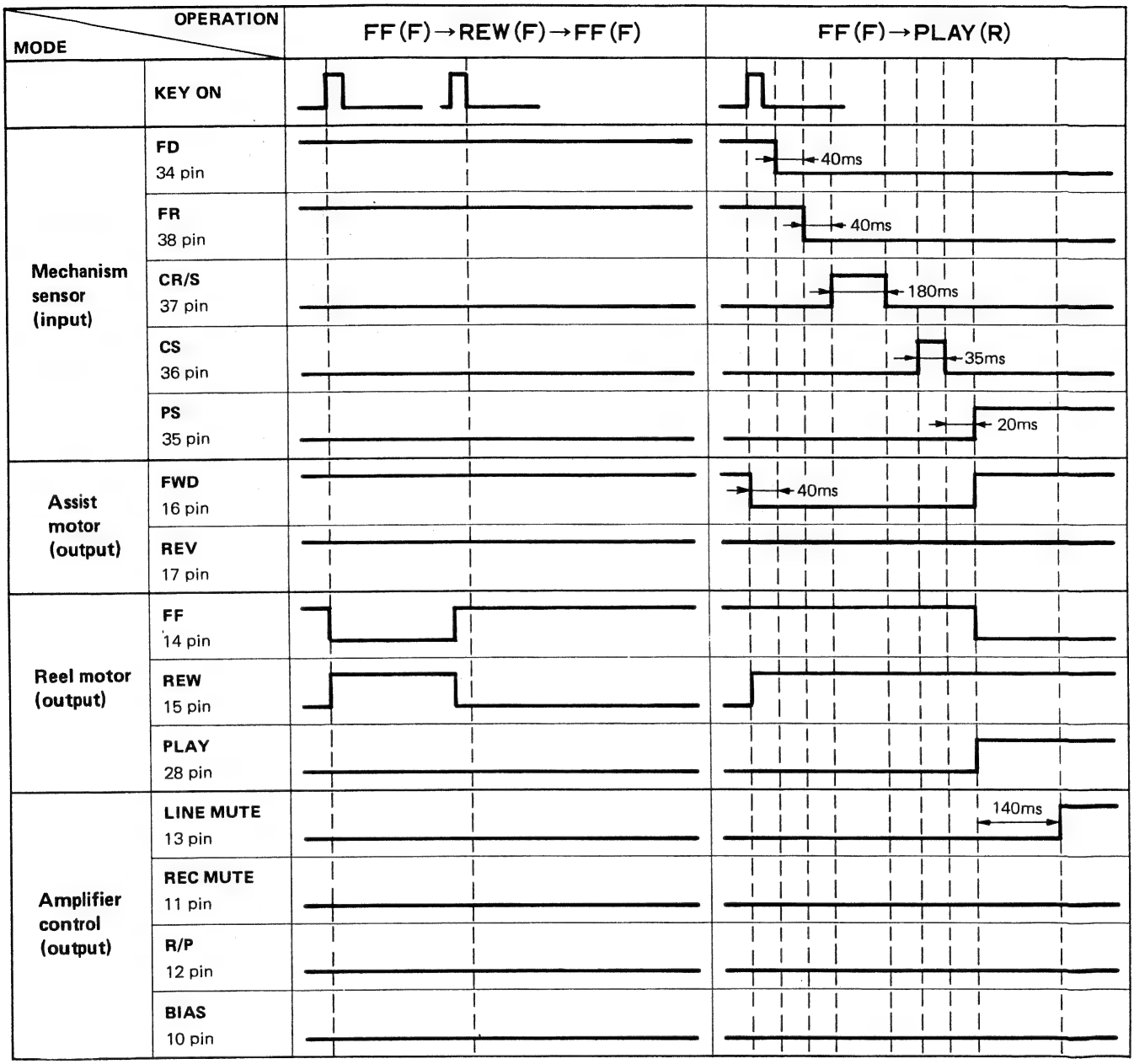
FD . . . DIRECTION FWD
FR . . . FF/REW
CR/S . . CUE RETURN/STOP
CS . . CUESTOP
PS . . PLAY STOP

CIRCUIT DESCRIPTION



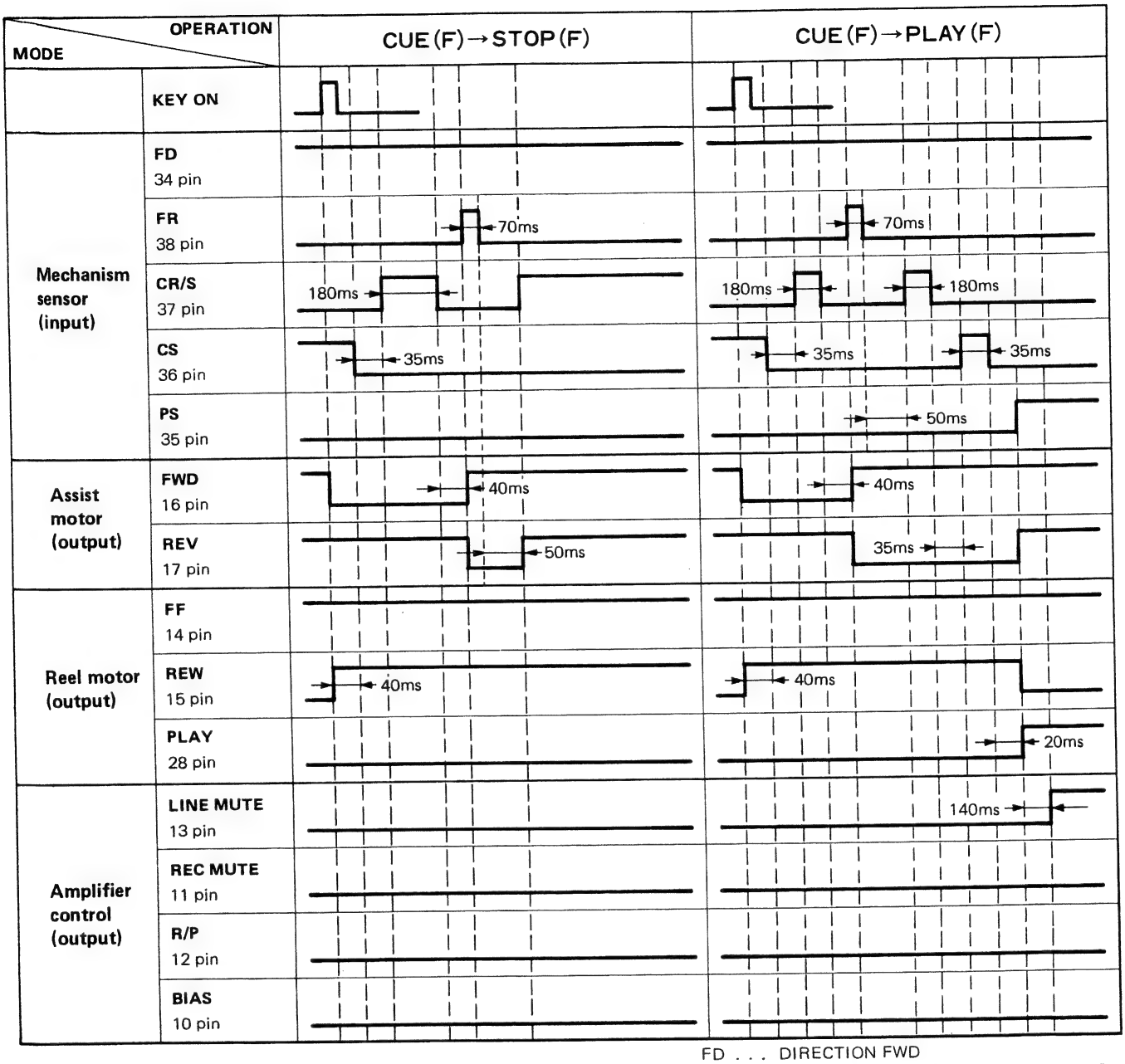
FD . . . DIRECTION FWD
FR . . . FF/REW
CR/S . . CUE RETURN/STOP
CS . . CUE STOP
PS . . PLAY STOP

CIRCUIT DESCRIPTION



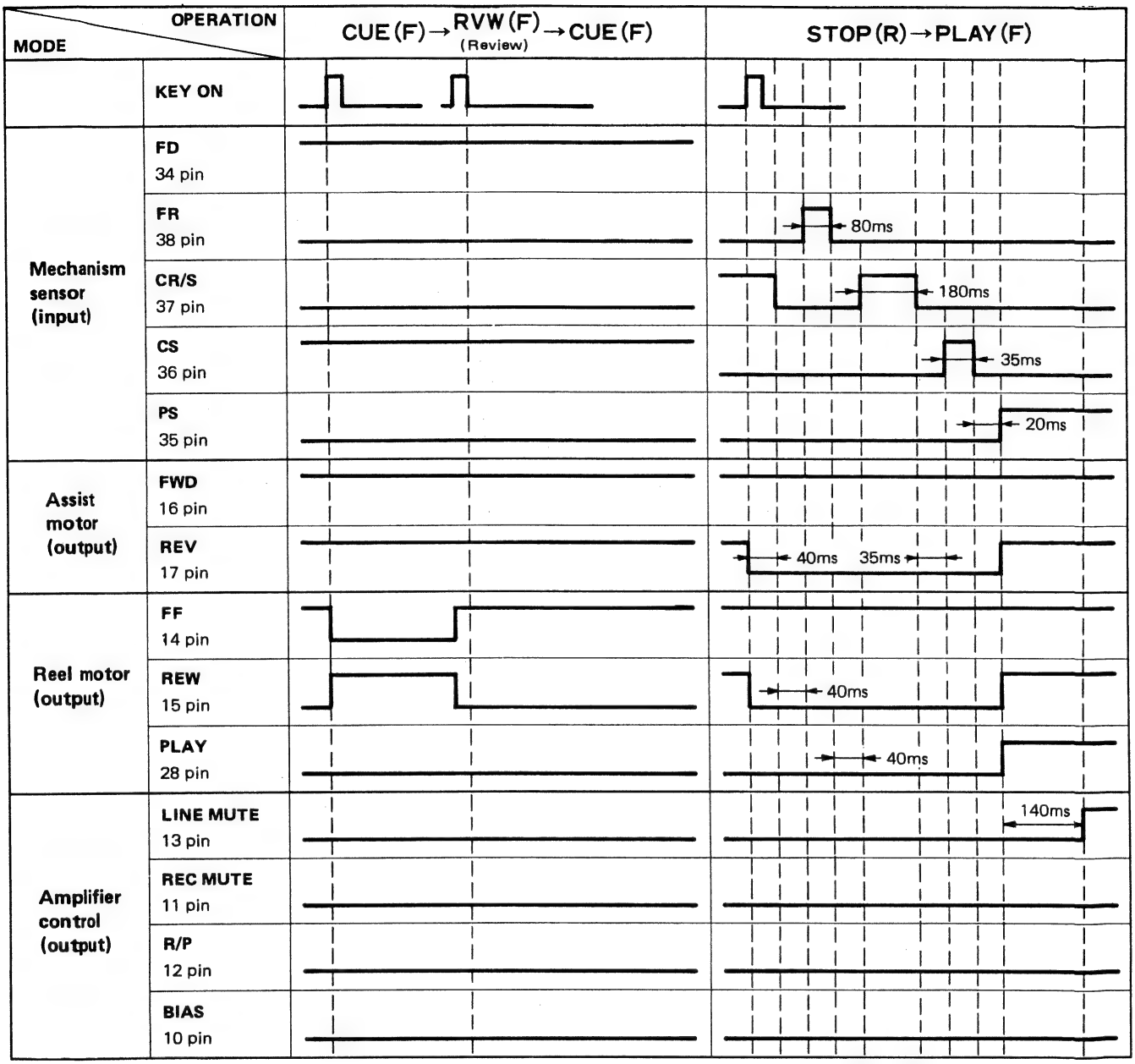
FD . . . DIRECTION FWD
FR . . . FF/REW
CR/S . . CUE RETURN/STOP
CS . . CUESTOP
PS . . PLAY STOP

CIRCUIT DESCRIPTION



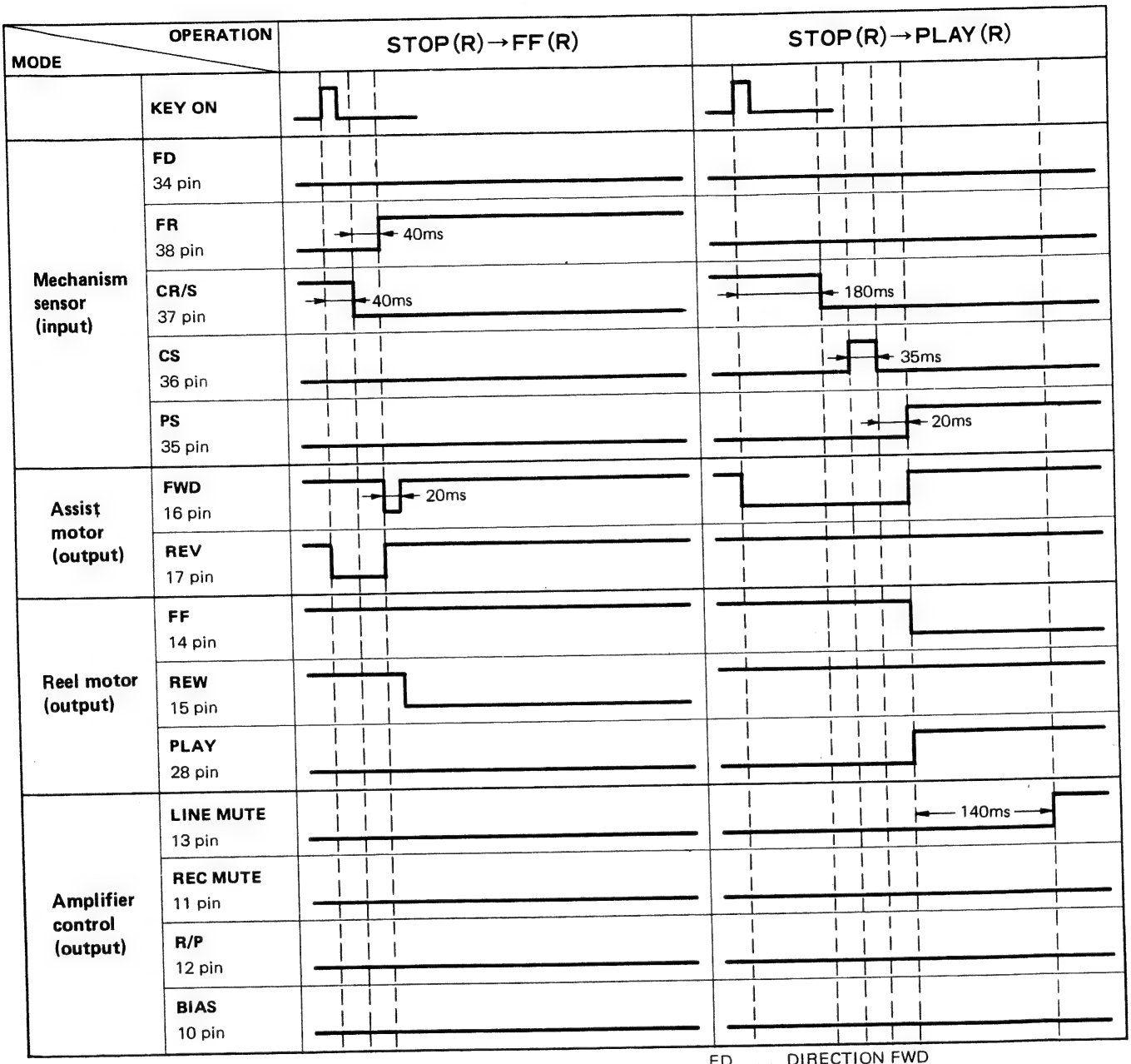
FD . . . DIRECTION FWD
FR . . . FF/REW
CR/S . . CUE RETURN/STOP
CS . . CUE STOP
PS . . PLAY STOP

CIRCUIT DESCRIPTION



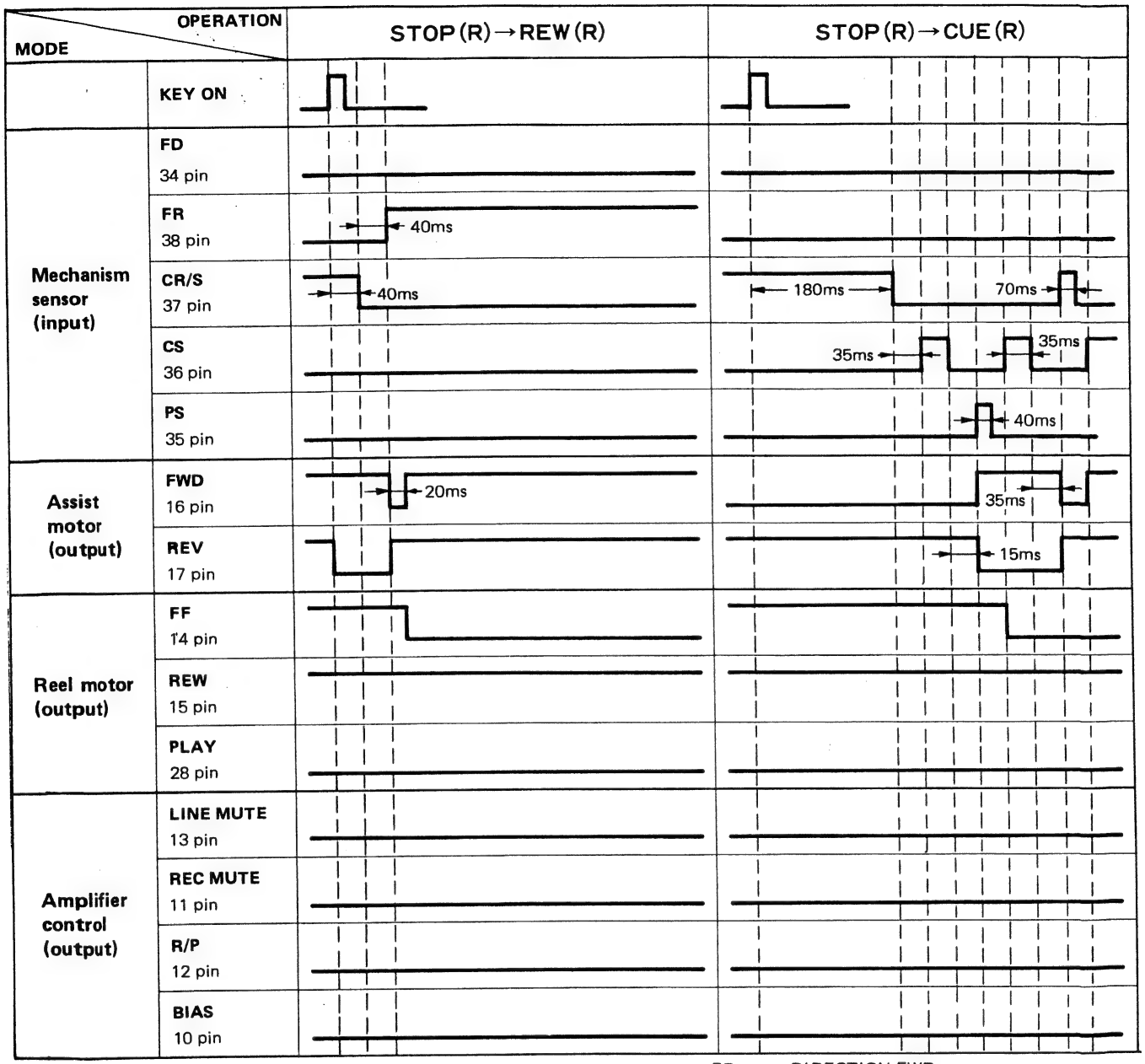
FD . . . DIRECTION FWD
FR . . . FF/REW
CR/S . . CUE RETURN/STOP
CS . . CUE STOP
PS . . PLAY STOP

CIRCUIT DESCRIPTION



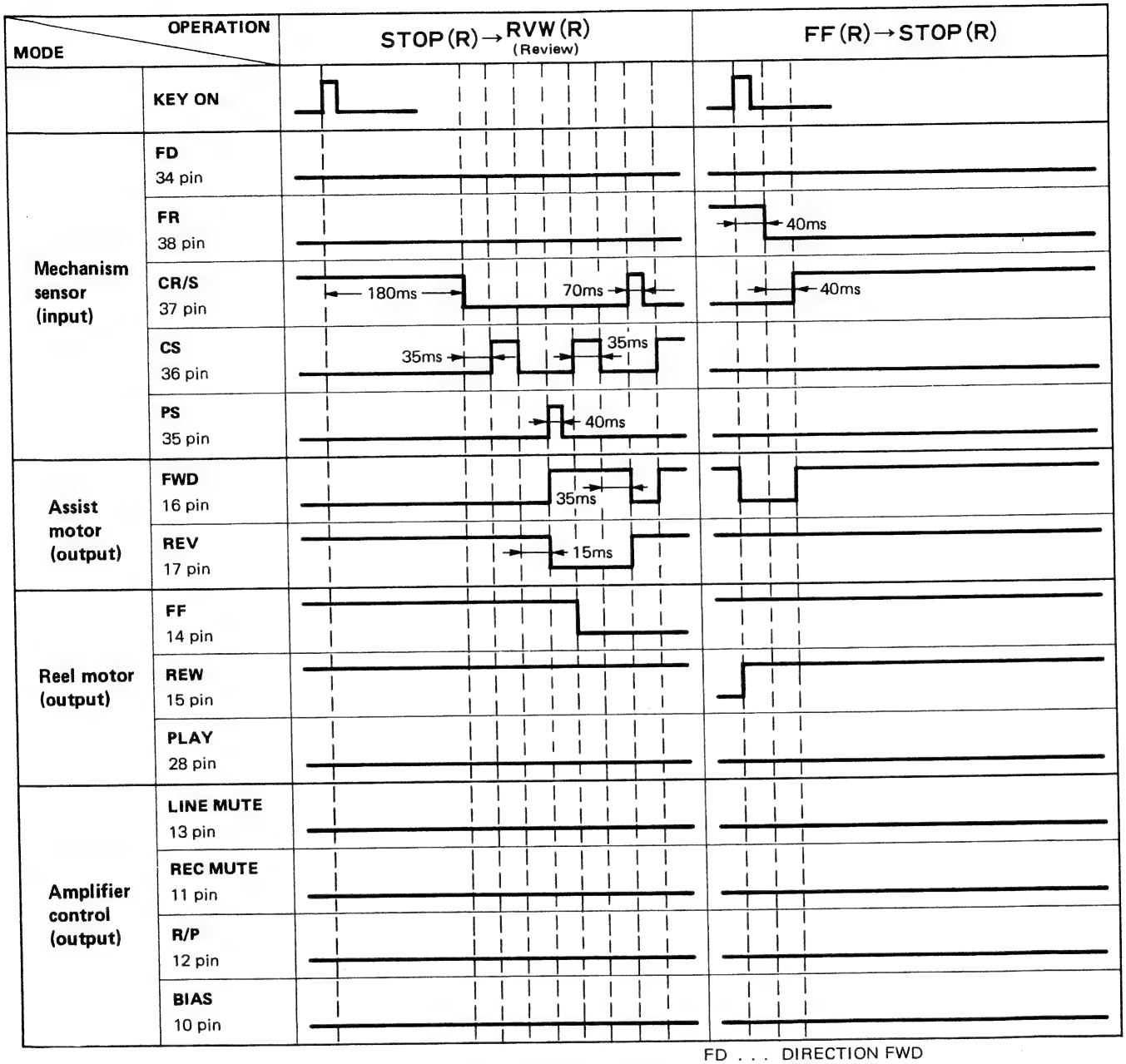
FD . . . DIRECTION FWD
FR . . . FF/REW
CR/S . . CUE RETURN/STOP
CS . . CUE STOP
PS . . PLAY STOP

CIRCUIT DESCRIPTION



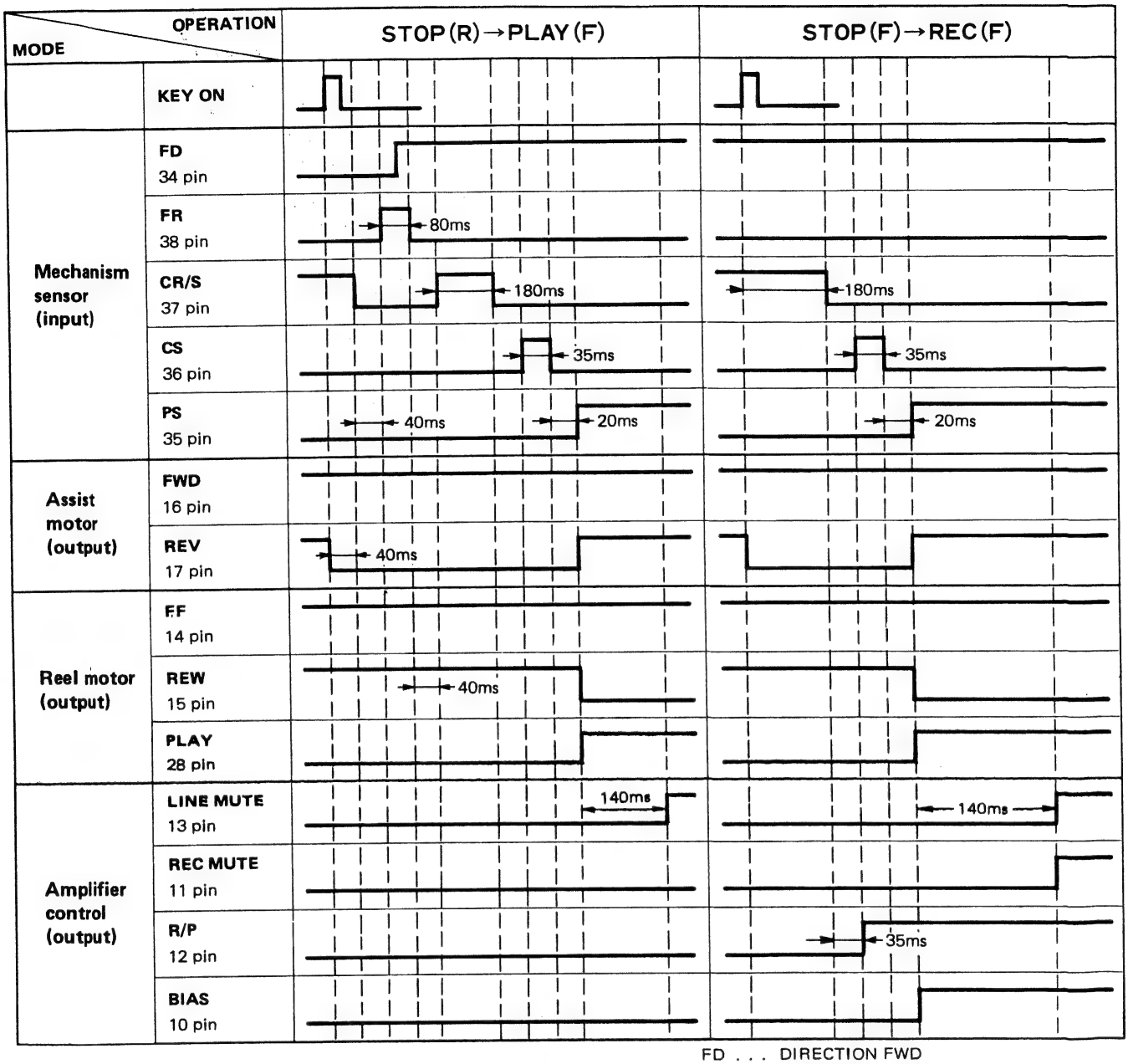
FD . . . DIRECTION FWD
FR . . . FF/REW
CR/S . . CUE RETURN/STOP
CS . . CUE STOP
PS . . PLAY STOP

CIRCUIT DESCRIPTION



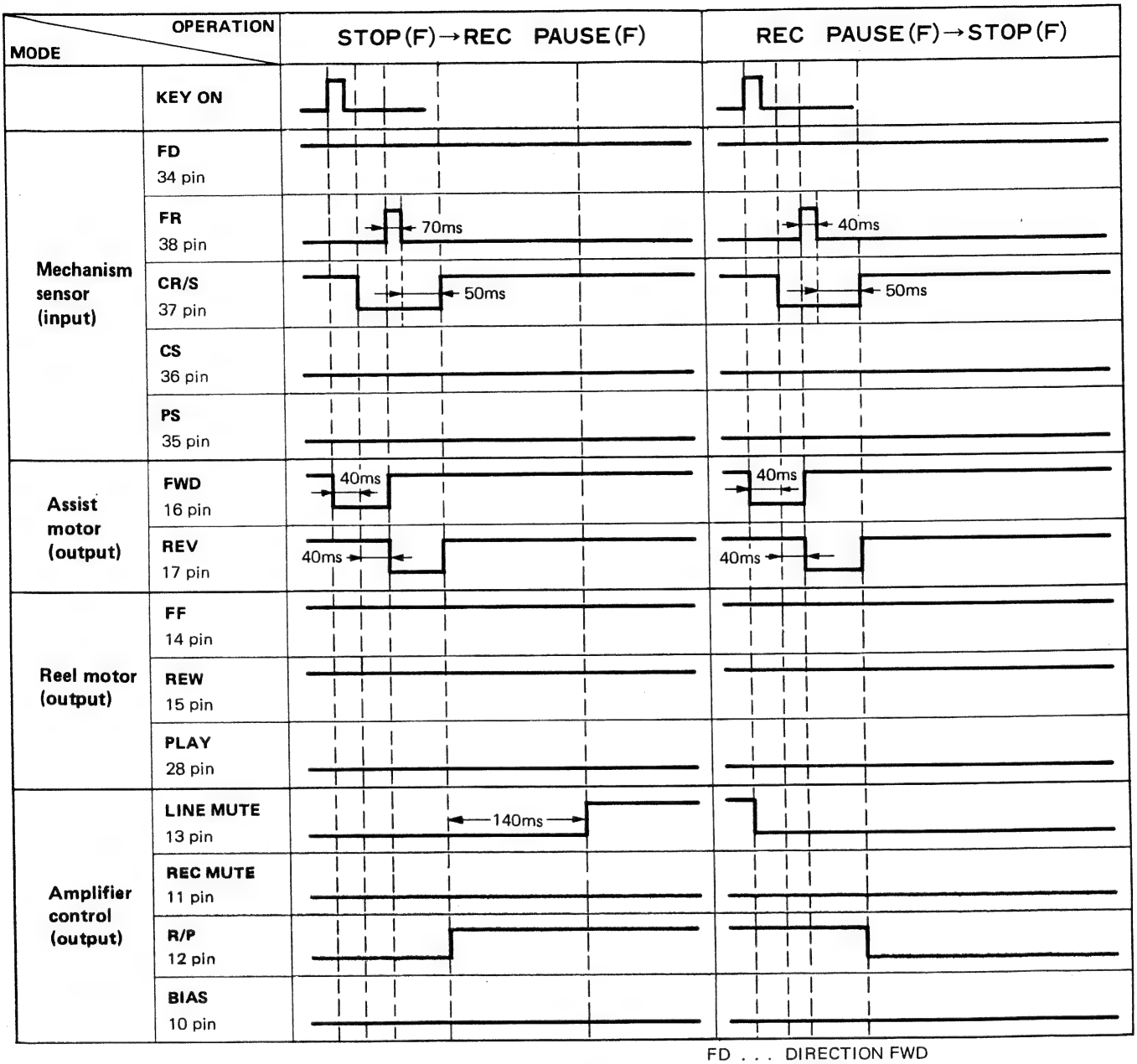
FD . . . DIRECTION FWD
FR . . . FF/REW
CR/S . . CUE RETURN/STOP
CS . . CUE STOP
PS . . PLAY STOP

CIRCUIT DESCRIPTION



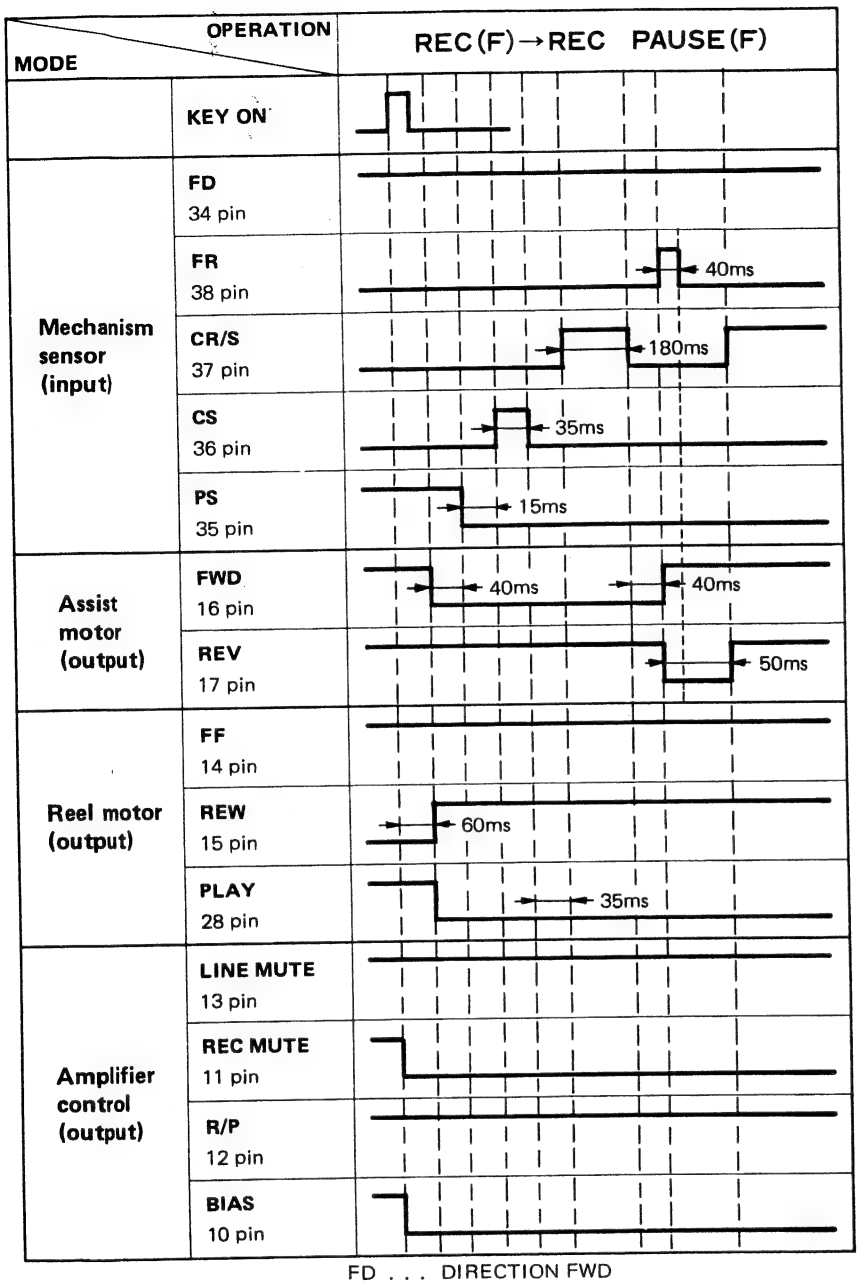
FD . . . DIRECTION FWD
FR . . . FF/REW
CR/S . . CUE RETURN/STOP
CS . . CUE STOP
PS . . PLAY STOP

CIRCUIT DESCRIPTION



FD . . . DIRECTION FWD
FR . . . FF/REW
CR/S . . CUE RETURN/STOP
CS . . CUE STOP
PS . . PLAY STOP

CIRCUIT DESCRIPTION



FD . . . DIRECTION FWD
FR . . . FF/REW
CR/S . . CUE RETURN/STOP
CS . . CUE STOP
PS . . PLAY STOP

DESCRIPTION OF MECHANISM OPERATION

Operation of 3-motor 2-way Record/Play Cassette Deck Mechanism

This cassette deck mechanism, one of the logic control auto-reverse mechanism series, has three motors; the capstan motor to drive the capstans in two ways, the reel motor to drive the reels and the mode control motor to set the operation modes such as play mode, rewind mode, etc.

Thus, as these three exclusive motors are used with their respective separate roles in driving the tape feed mechanism, many levers and other devices needed in conventional tape feed mechanisms are omitted, thus permitting a greatly simplified mechanism with higher operational reliability, lower failure rate and easier maintenance.

In addition, as this cassette deck mechanism performs all operaiton mode controls entirely electrically, operability is excellent, permitting all logic operations including auto-reverse, remote control, etc.

The basic construction for feeding the tape consists of the following three sections :

1. Capstan drive system

The forward and reverse capstans which have a rubber belt on their respective flywheels in an S shape are driven by the exclusive capstan motor.

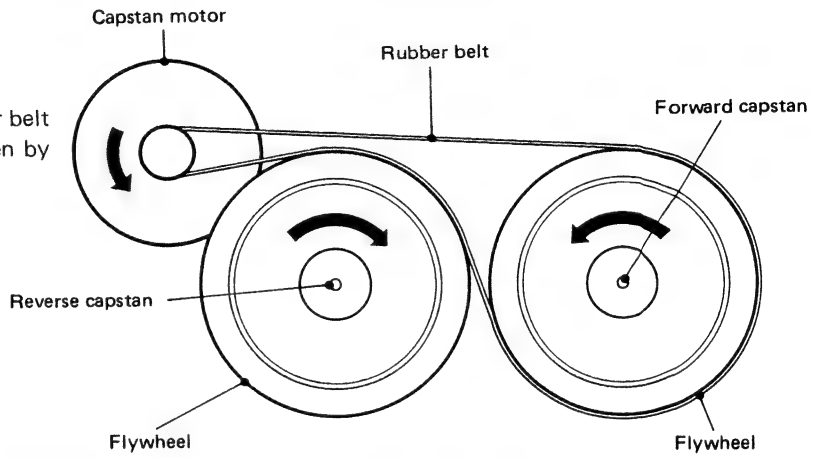


Fig. 1

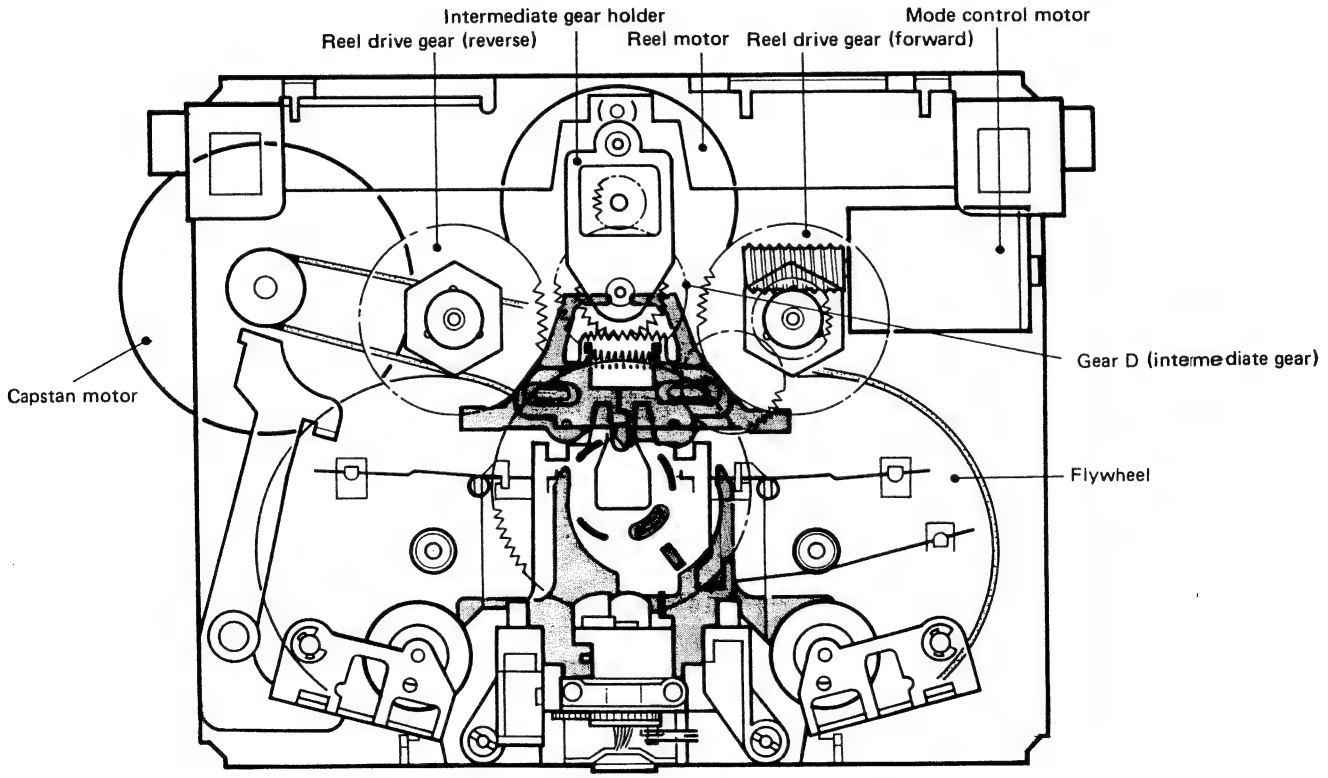


Fig. 2 (surface view)

DESCRIPTION OF MECHANISM OPERATION

2. Reel drive system

The reel at the takeup side is driven by the relevant reel drive gear which engages the intermediate gear by the rotating force generated in the rotating direction of the exclusive reel motor; the intermediate gear engages with the gear mounted to the reel motor shaft and it can move freely to the right and left.

The rotating direction of the reel motor is changed by changing the polarity of the motor applied voltage and the travel speed of the tape (in play or fast forward mode, etc.) is controlled by changing the motor applied voltage.

3. Mode control system

The rotation of the mode control motor is decelerated by the worm gear to rotate the cam disc plate. The first cam to control the direction of the rotary head and the second cam to set an operation mode such as play, fast forward, cue, etc. are placed under the cam disc plate. The four leaf contacts located above the cam disc plate come in contact with the conductor code patterns which correspond to the operation modes.

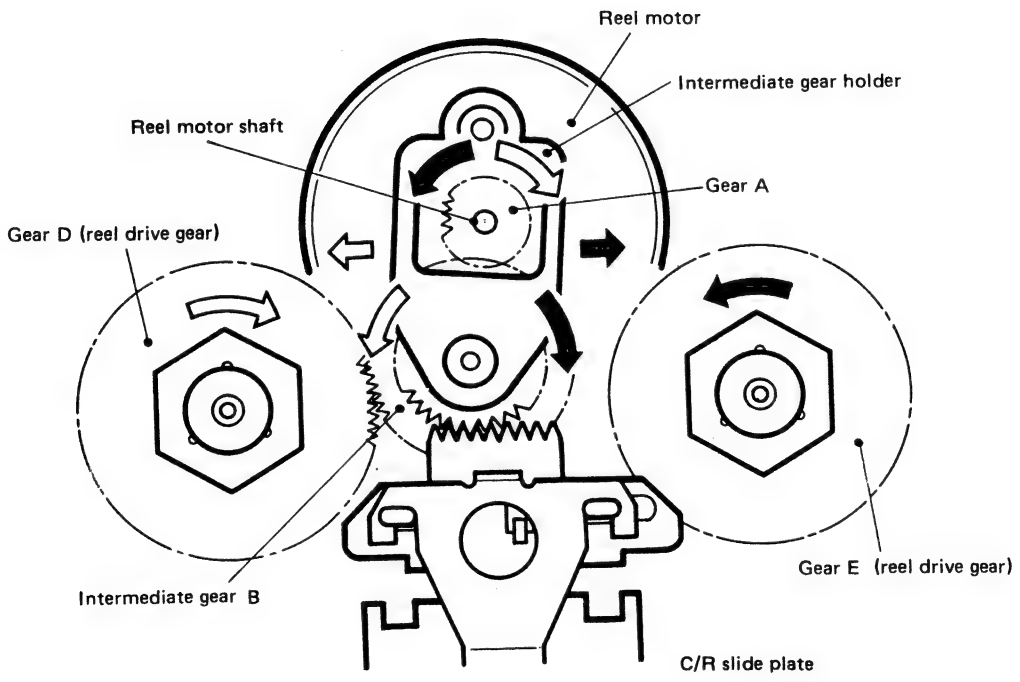
As the cam disc plate rotates, the relative position between the conductor code patterns and the leaf switch contacts varies so that a combination voltage, i.e. a mode code, appears in the output terminal on a code pattern.

At input of this combination voltage, the controller judges that the cam disc plate turns to the postion of the required operation mode. The operation mode is thus controlled.

Next, the basic operation of the tape feed mechanism.

A variety of usages are possible according to the programming of the controller as the mechanism construction permits all operation modes to be controlled electrically.

The following description gives provisional explanatory examples for basic operaiton.



DESCRIPTION OF MECHANISM OPERATION

A. Stop (forward) mode

Fig. 3a represents the cam drive system in mode control as viewed from the rear of the deck and Fig. 3b indicates the cassette mechanism as viewed from above.

1) The brake cam is placed under gear D as shown in Fig. 3a. Thus, as the top end of the brake lever engages the a reel drive gear with the triangular protrusion of a brake lever in the concave of a brake cam, the reel drive gear is prevented from rotating and the reel is braked.
2) The first cam is placed under the cam disc plate as shown in Fig. 3a. In this cam disc plate position, the rotary head is set at the forward record/play position with the rotary head direction selector slide plate shifted to the left.
3) The second cam is positioned as shown in Fig. 3a. At this time, the drive catch of the forward pinch roller slide base is in contact with the left top end of the second cam as shown in Fig. 3b. In this state of the drive catch, the rotary head and the pinch roller (forward) recede out of contact with the tape with the pinch roller slide base (forward) and the head base lowered.

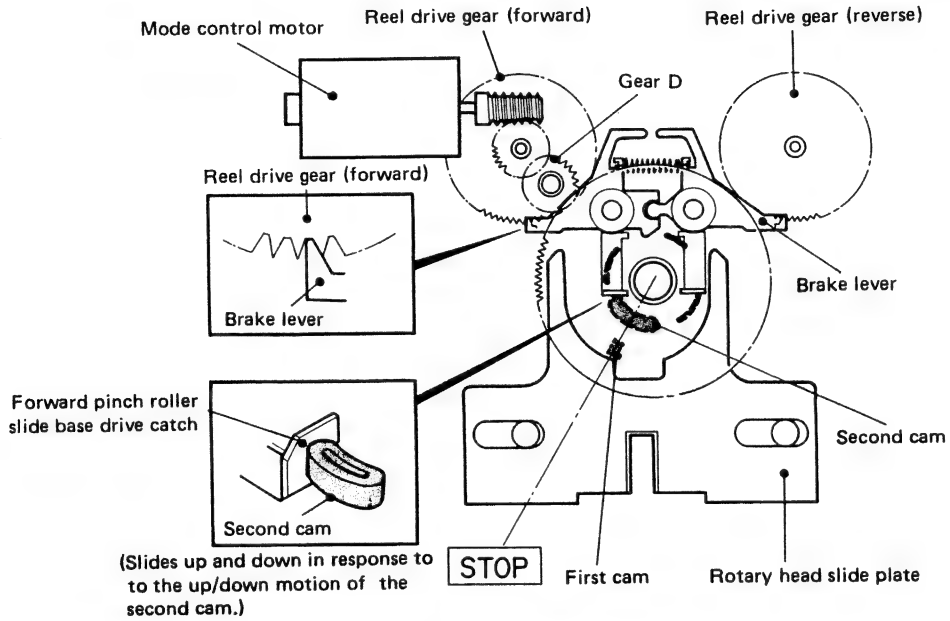


Fig. 3a (rear view)

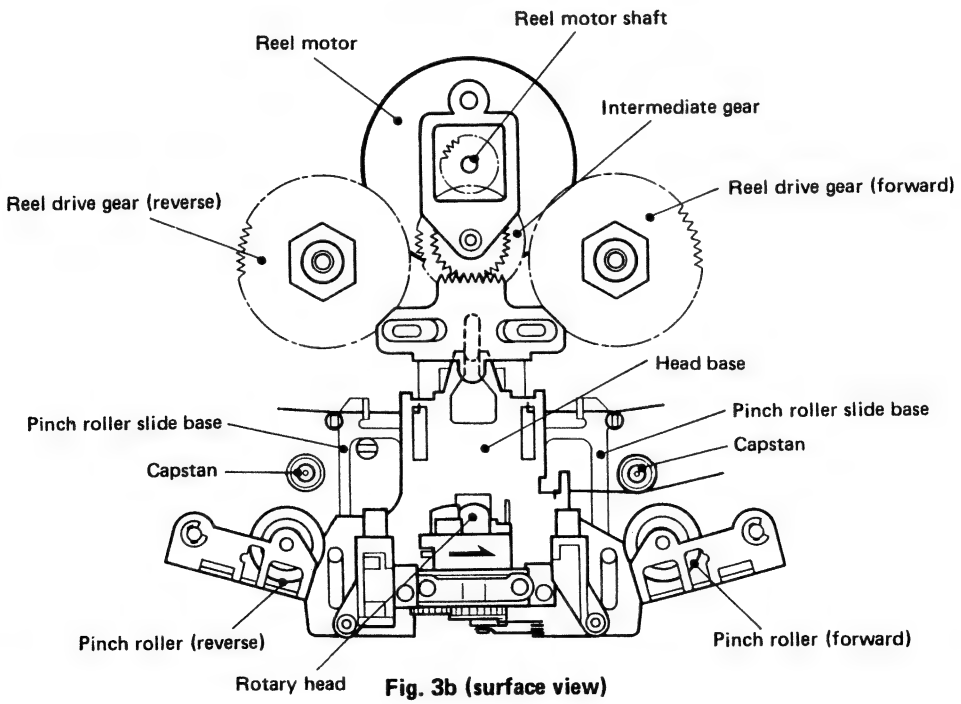
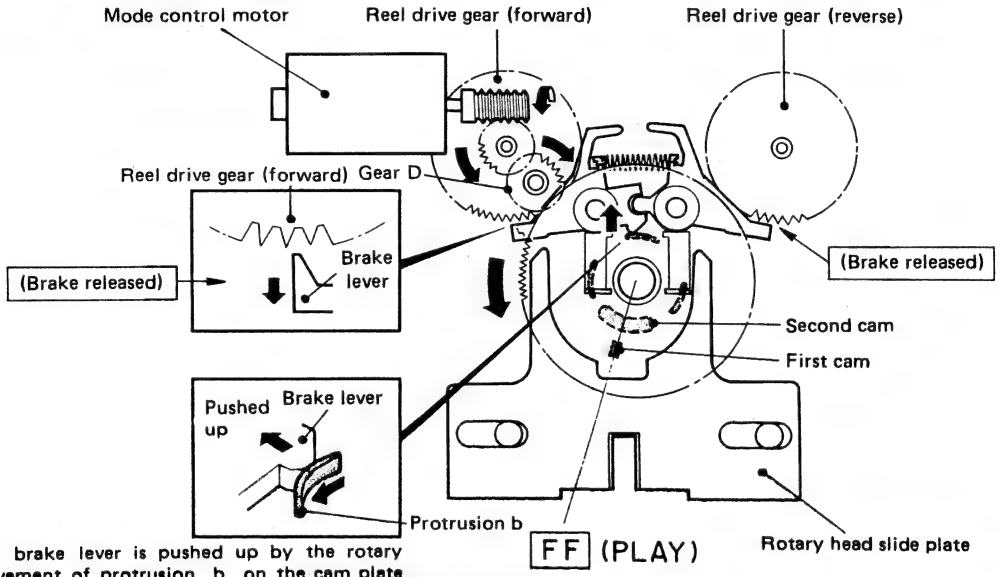


Fig. 3b (surface view)

DESCRIPTION OF MECHANISM OPERATION

B. Fast forward (FF) mode

1) When the FF button is pressed, the controller drives the mode control motor to rotate the cam disc plate in the direction of the arrow in Fig. 4a.
2) Thereby, the brake cam turns slightly clockwise and lifts up the triangular protrusion of the brake so that the brake is released as shown in Fig. 4a.
3) In addition, when the cam disc plate turns to the position shown in Fig. 4a, the fast forward (FF) mode code is generated by its associated code pattern.
   When the controller detects this code, it issues an instruction to stop the voltage applied to the mode control motor. Thereby, the mode control motor stops. The fast forward (FF) mode is established in this manner.
4) Since the second cam on the cam disc plate turns counterclockwise, the position of the pinch roller slide base drive catch (forward) does not change. Therefore, the head and the pinch roller remain lowered.
5) When the controller detects the fast forwared mode, it issues an instruciton to supply to the reel motor a high voltage whose polarity corresponds to fast forward mode so that the reel motor rotates at high speed in the forward direction. By this rotation, the intermediate gear is moved to the right and engaged with the reel drive gear (forward) at the right side. Thus, the tape travels in fast forward mode.



The brake lever is pushed up by the rotary movement of protrusion b on the cam plate to release the brake.

Fig. 4a (rear view)

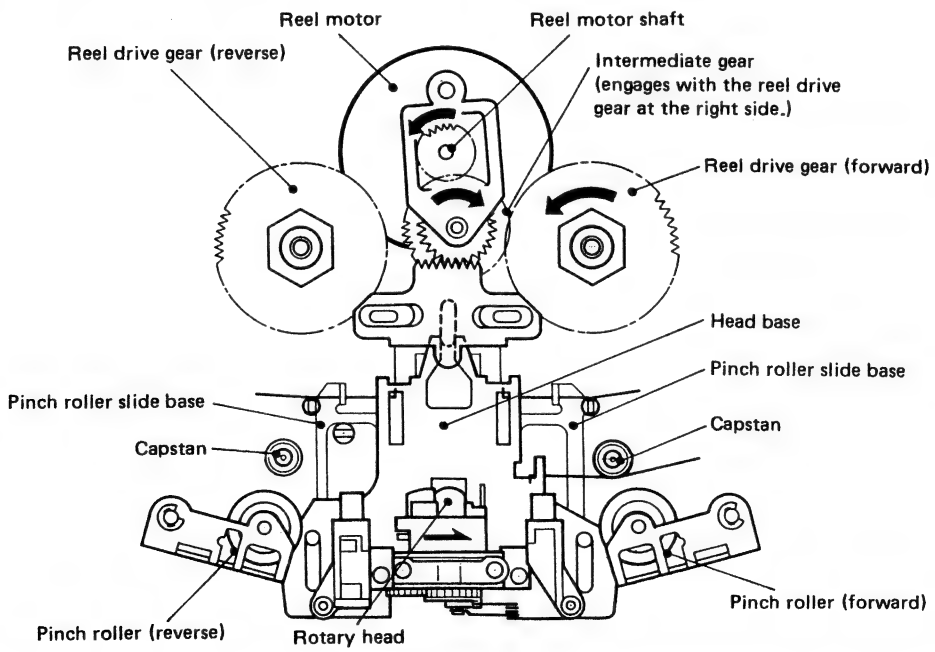


Fig. 4b (surface view)

DESCRIPTION OF MECHANISM OPERATION

C. Play (forward) mode

1) When the play button is pressed, the controller issues an instruction to turn the cam disc plate in the direction of the arrow as shown in Fig. 5a.
2) Thereby, the second cam on the cam disc plate pushes up the drive catch of the forward pinch roller slide base (right). When the cam disc plate turns to the position shown in Fig. 5a, the play (forward) mode code is generated by its associated code pattern. When the controller detects this code, it works to stop the mode control motor.
3) In this cam position,
   a) As the brake cam is at the non-braking position as shown in Fig. 5a, the brake is released.
   b) As the drive catch of the forward pinch roller slide base (right) moves to the uppermost (play) position, the pinch roller (forward) comes up in contact with the capstan. At this time, the head base slides up in response to the motion of the pinch roller so that the head comes in contact with the tape.
   c) The controller designates the polarity and voltage of the power required for the reel motor in play (forward) mode and issues an instruction to supply it to the reel motor.
   Thereby, the reel motor rotates in the forward direction on the voltage corresponding to play mode. By this rotation, the intermediate gear is moved to the right and engaged with the reel drive gear (forward) at the right side. Thus, the tape travels in play (forward) mode.

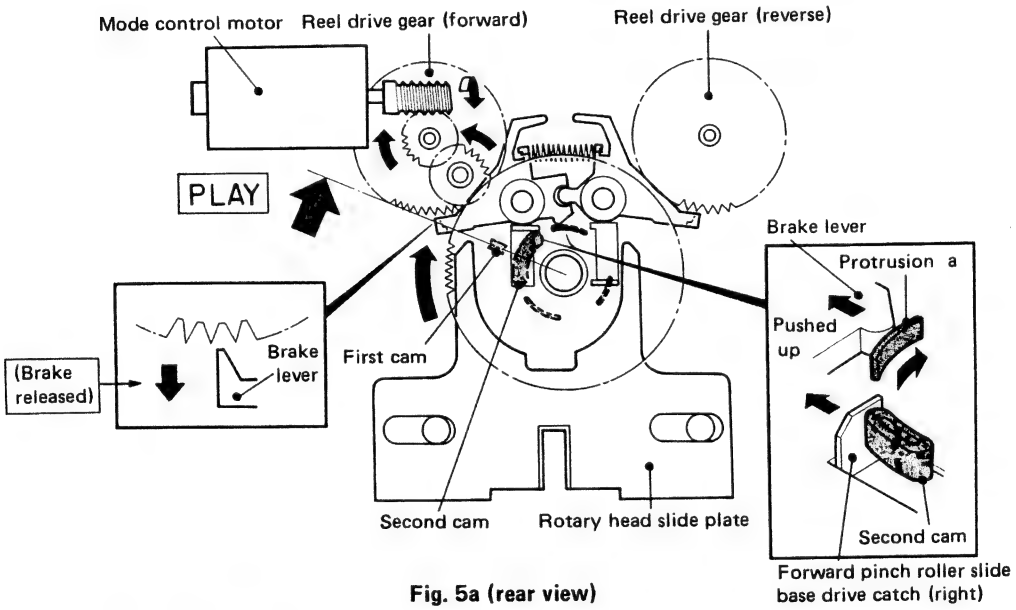


Fig. 5a (rear view)

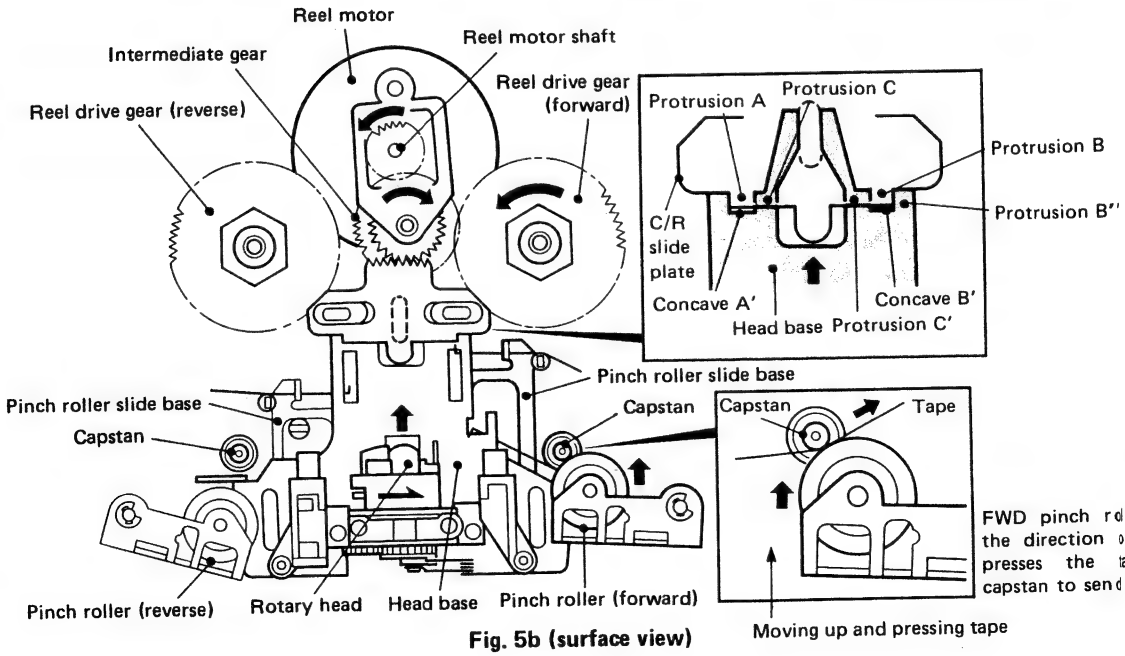
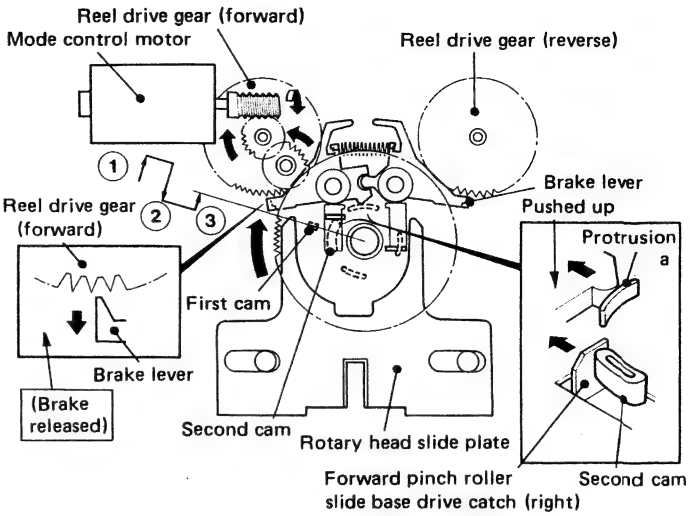


Fig. 5b (surface view)

DESCRIPTION OF MECHANISM OPERATION

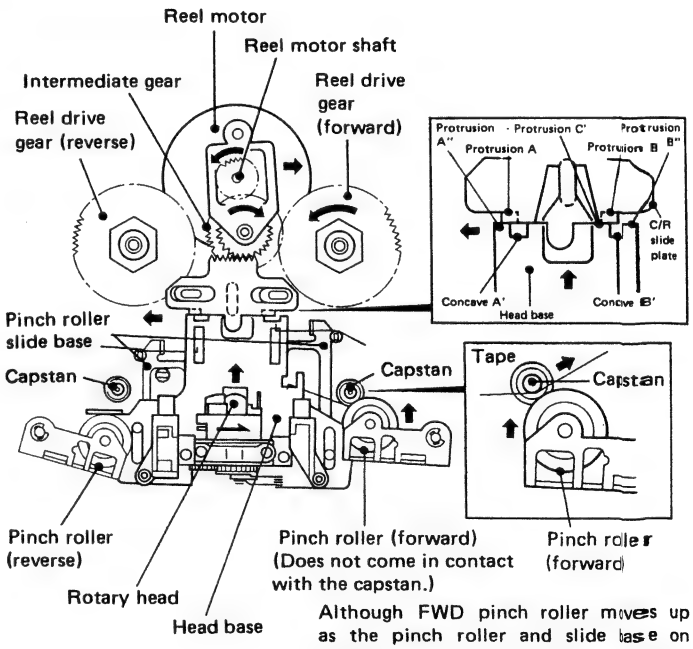
D. Cue mode

1) when the cue button is pressed in stop mode, the controller works to rotate the mode control motor to turn the cam disc plate in the direction of the arrow as shown in Fig. 6a. When the second cam on the cam disc plate pushes up the drive catch of the forward pinch roller slide base (right), the pinch roller (forward) and the rotary head move up correspondingly.
2) As the triangular protrusion of the brake lever comes in contact with the brake cam at its upper position, the brake is released.
3) the cam disc plate turns to the play position once. (Thus, the head and the pinch roller (forward) also move to their play position once.)
   When the cam disc plate reaches the play postion, the controller issues an instruction to reverse the rotation of the mode control motor. When the cam disc plate thus turns reversely and stops at the position which is slightly lower than the cue position shown in Fig. 6a, the controller issues an instruction to rotate the reel motor at high speed in the forward direction.
4) When the reel motor is rotated at high speed in the forward direction, the intermediate gear is moved to the right and engaged with the reel drive gear (forward) so that the tape travels in cue mode. In this state of the mechanism, as the head base is at a position slightly lower than the play position because of the reverse rotation of the cam disc plate, protrusions A and B under the C/R slide plate are released from concaves A' and B' in the head base (in play mode, protrusions A and B are secured in concaves A' and B' to prevent the C/R slide plate deviating to the right and left) so that the C/R slide plate is free. Thus, the C/R slide plate moves to the left due to the rotation of the reel motor.
5) At the same time the C/R slide plate moves to the left, a pulse voltage is again supplied to the mode control motor to turn the cam disc plate clockwise. Thereby, the head base slides up again in response to the drive catch of the forward pinch roller slide base (right). At this time, since protrusions A and B in the C/R slide plate have already been shifted to the left, they cannot engage with concaves A' and B' in the head base.
   Therefore, top ends A'' and B'' of the head base strike protrusions A and B in the C/R slide plate to stop the up motion of the head base for cue mode.
6) In this state of the mechanis, the pinch roller (forward) is slightly away from the capstan and the head is at a position at which it is in light contact with tape. Thus, when the tape travels at high speed, a recording signal is played back as a high-pitched sound. In addition, the pinch roller slide base (right) moves to a position slightly higher than the position at which the head base stops, and presses against the head base upwards by the spring.



Protrusion a fixed to the cam plate and the second cam move up according to the rotation of the cam plate, but they are fixed at position (3) shown above.

Fig. 6a (rear view)



Although FWD pinch roller moves up as the pinch roller and slide base on FWD side move up, the pinch roller and capstan do not pinch the tape because of the relationship among position 3) indicated by the arrow in Fig. 6a Cueing Operation (Rear view) and protrusions and concaves of C/R slide plate and head base.

Fig. 6b (surface view)

DESCRIPTION OF MECHANISM OPERATION

E. Play (reverse) mode

1) When the play (reverse) button is pressed from forward stop mode, the controller works to rotate the mode control motor so that the cam disc plate turns counterclockwise from the stop position in Fig. 3a.
2) The first and second cams on the cam disc plate also turn. At this time, the first cam slides the rotary head direction selector slide plate to the right. Thereby, the rotary head turns 180° to the reverse play position. (See "**K. Section of rotary head direction**".)
3) On the other hand, the second cam pushes up the drive catch of the reverse pinch roller slide base (left). When the cam disc plate turns to the position in Fig. 7a, the play (reverse) mode code is generated by its associated code pattern. Thus, when the controller detects this code, it acts to stop the mode control motor.
4) In this cam position,
   a) As the brake cam is at the no-braking position as shown in Fig. 7a, the brake is released.
   b) As the drive catch of the reverse pinch roller slide base (left) moves to the uppermost (play) position, the pinch roller (reverse) comes up in contact with the capstan (Fig. 7b). At this time, the head base slides up in response to the motion of the reverse pinch roller slide base so that the head comes in contact with the tape.
   c) The controller designates the polarity and voltage of the power required for the reel motor in play (reverse) mode and issues an instruction to supply it to the reel motor. Thereby, the reel motor rotates in the reverse direction on the voltage corresponding to play mode. By this rotation, the intermediate gear is moved to the left and engaged with the reel drive gear (reverse) at the left side. Thus, the tape travels in play (reverse) mode.

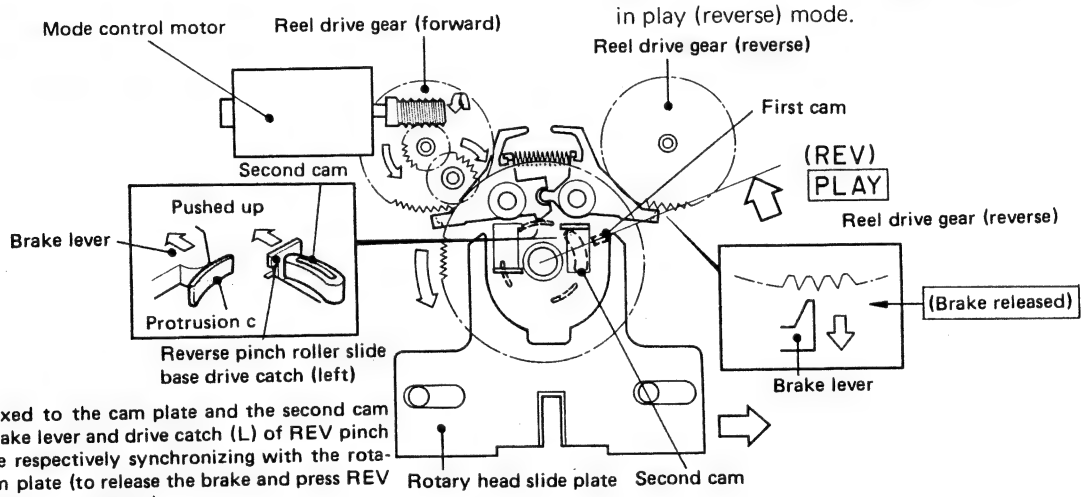


Fig. 7a (rear view)

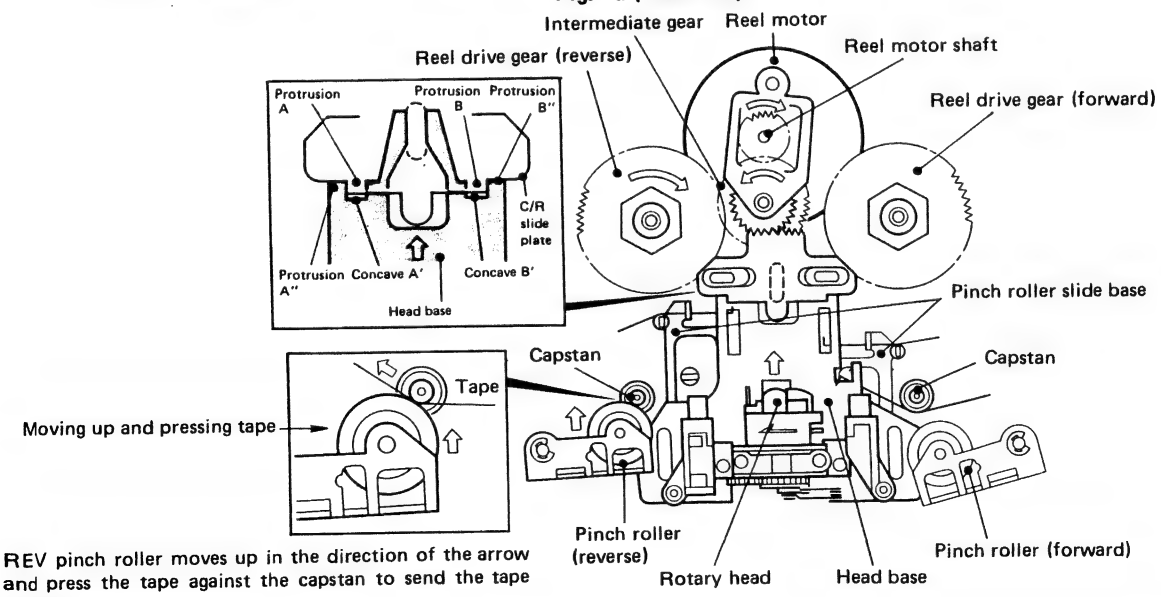


Fig. 7b (surface view)

DESCRIPTION OF MECHANISM OPERATION

F.Stop (reverse) mode

1) When the stop button is pressed from reverse play mode, the controller works to rotate the mode control motor so that the cam disc plate turns clockwise.
   The controller also acts to stop the reel motor.
2) The second cam on the cam disc plate turns downwards, Thereby, as the drive catch of the reverse pinch roller slide base descends, the pinch roller (reverse) and the head base also descend. When the cam disc plate thus comes to the stop position in Fig. 8a, the stop (reverse) mode code is generated by its associated code pattern. When the controller detects this code, it acts to stop the mode control motor.
3) At this time, the brake cam turns and engages with the triangular protrusion of the brake at its lower position. Thus, the reel drive gear (reverse) is braked so that the reel stops suddenly.

G. Pause mode

Description is omitted as it is mechanically the same as stop mode.

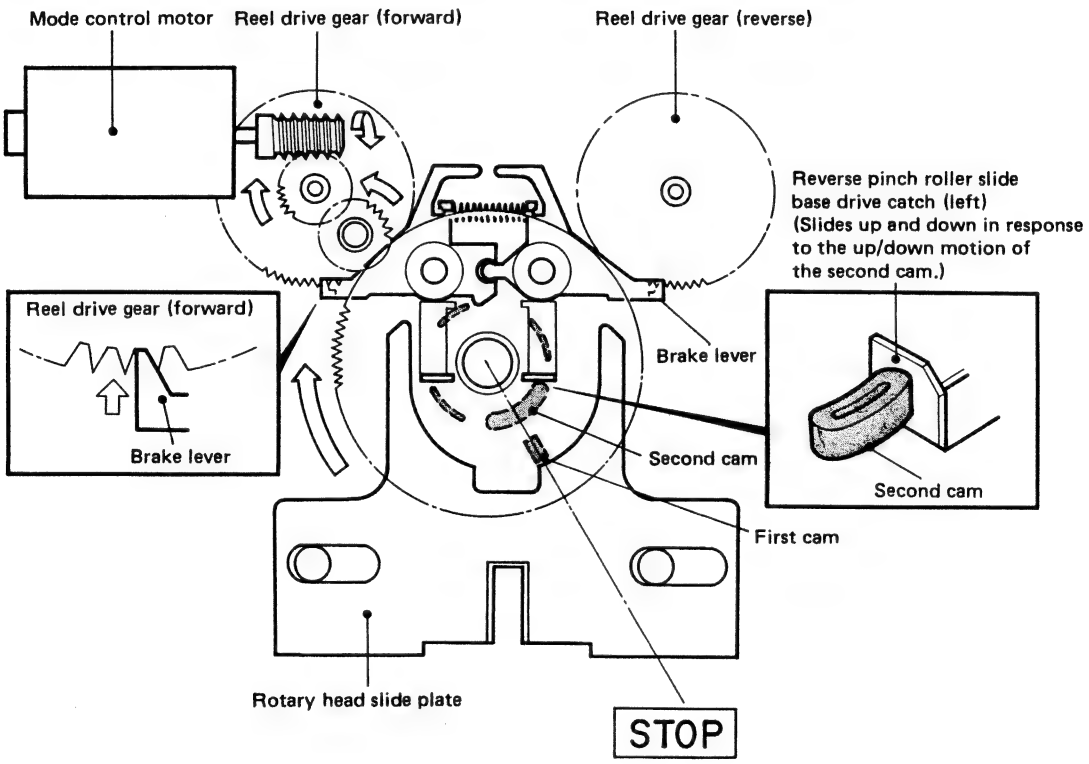


Fig. 8a (rear view)

DESCRIPTION OF MECHANISM OPERATION

H. Rewind (REW) mode

1) When the rewind (REW) button is pressed from reverse stop mode, the cam disc plate turns clockwise to the rewind position. At this time, the rewind mode code is generated by its associated code pattern, indicating that the rewind mode is established. When the controller detects this code, it works to stop the mode control motor.
2) In this state of the mechanism, the brake cam turns in the direction of the arrow in Fig. 9a to release the brake.
3) When the controller receives the rewind mode control signal, it immediately generates a signal to rotate the reel motor is thus rotated, the intermediate gear is moved to the left and engaged with the reel drive gear (reverse) at the left side so that the left reel rotates to rewind the tape.
4) As the drive catch of the reverse pinch roller slide base (left) does not move, the pinch roller (reverse) and the head remain at the stop position.

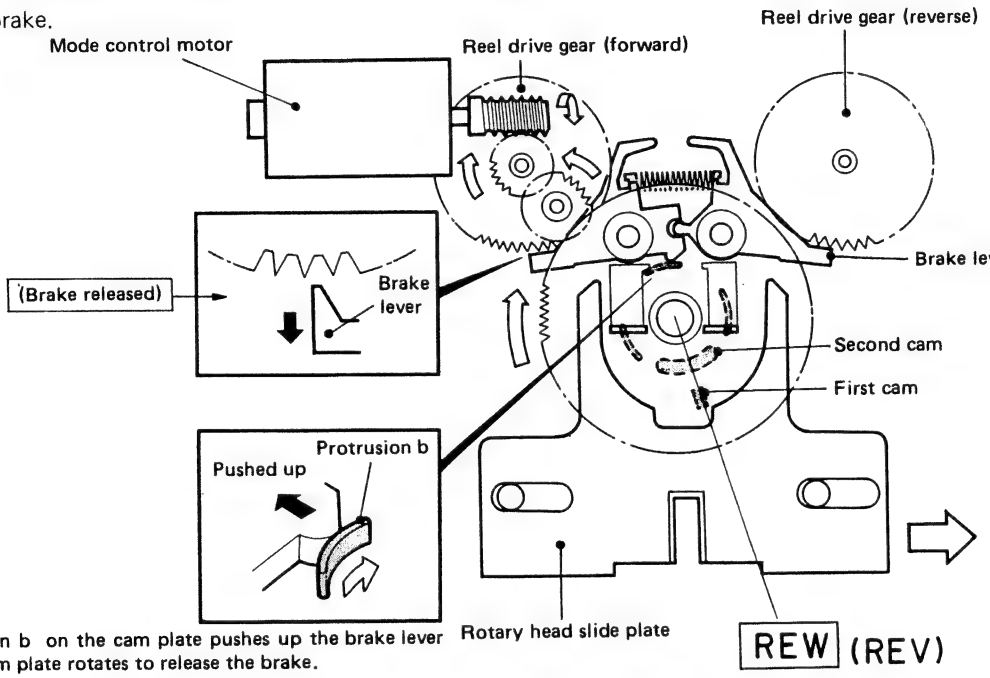


Fig. 9a (rear view)

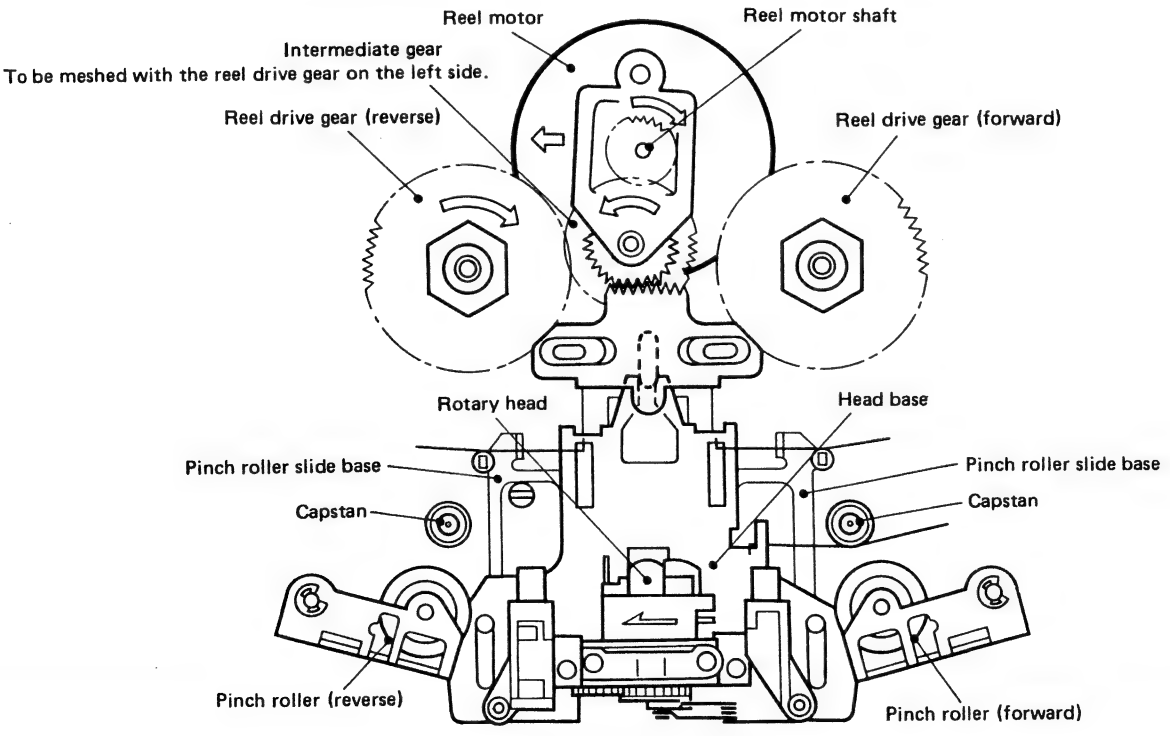
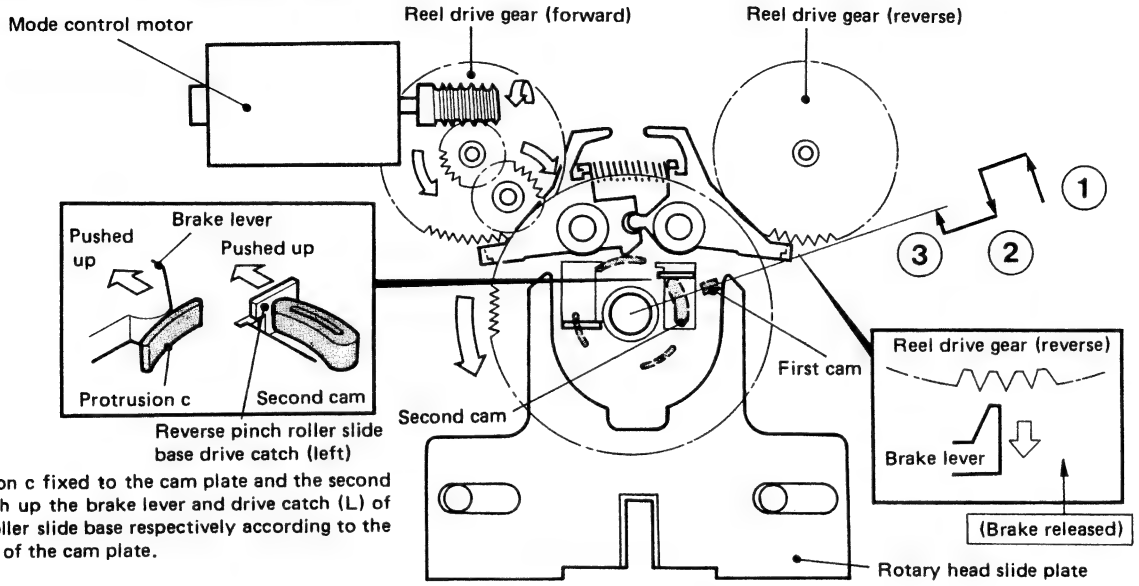


Fig. 9b (surface view)

DESCRIPTION OF MECHANISM OPERATION

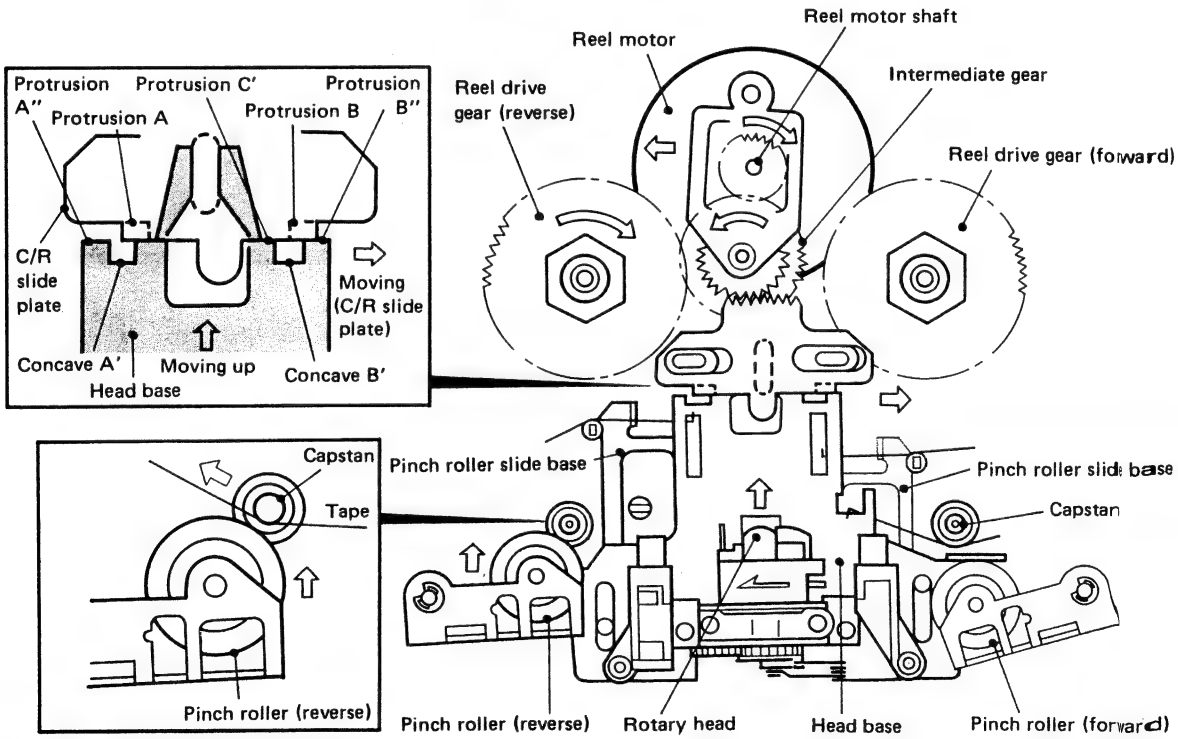
I. Review (cue) mode

1) The review operation reverses the forward direction of the tape. In this way, the review operation is just the same as the cue operaiton, except that in the review operation, the reverse pinch roller is raised near to the reverse capstan, the left reel drive gear is driven by moving the intermediate gear to the left, and the C/R slide plate, the first and second cams, etc. are moved to the right, in contrast with the cue operation. However, the turning of the rotary head and the review operation of the mechanism are performed separately. For this purpose, it is necessary to set up logic so that the rotary head also turns to the review position automatically when the review (REV) button is pressed. This also applies to the cue operation.



Protrusion c fixed to the cam plate and the second cam push up the brake lever and drive catch (L) of pinch roller slide base respectively according to the rotation of the cam plate.

Fig. 10a (rear view)



As REV pinch roller slide base moves up, REV pinch roller is moved up and fixed to positions (1)—(3) indicated by the arrows in Fig. 10a Review Operation (Surface view). This operation is carried out to perform the review operation without fitting the protrusion into the concave according to the relationship between the head base and C/R slide plate.

Fig. 10b (surface view)

DESCRIPTION OF MECHANISM OPERATION

J. Direct mode change operation

The respective modes at items A~I are described mainly based on stop mode. However, the mode can be changed directly from forward play to reverse play, etc. without going via stop mode. As mentioned before, the controller always knows the current operation mode of the mechanism by checking the output of a relevant code pattern.

Therefore, the mode can be changed in the shortest operation route from the current mode to the required mode, whatever it is, by programming the controller.

For example, assume the mode is to be changed from fast forward mode to rewind mode. At this time, the controller knows that the head and the pinch roller (forward) are lowered in fast forward mode at present. Thereupon, when the controller is programmed so as to stop the mode control motor once, brake the reel drive gear (forward), move the cam disc plate to the rewind position by rotating the mode control motor again, and reverse the rotation of the reel motor, the intermediate gear is automatically moved to the left to engage with the reel drive gear (reverse) at the left to enter rewind mode.

In due course, it is possible to change directly from one mode to any other mode through a similar process. As tens of combinations of mode changes can be set, further description is omitted here.

K. Selection of rotary head direction

1) The rotary head slide plate is slid to the left by turning the first cam on the cam disc plate clockwise (or to the right by turning counterclockwise.) Then, the rotary head direction selector lever is moved to the left (or right) by the slit provided on the rotary head slide plate, by which the direction of the rotary head is changed. In detail, as shown in Fig. 12, when the rotary head slide plate is slid to the right, the top end of the rotary head direction selector lever is moved to the right by the slit on the rotary head slide plate. Gear A thereby turns counterclockwise. Thus, the rotary head engaged with this gear turns 180° to the forward record/play position.
2) When the rotary head is to be set to the reverse record/play position, the rotary head slide plate is slid to the left.
3) The spring provided provides a snap action to set the head to the correct postion at any time.

L. Tape end sensor mechanism (auto-stop, quick reverse, etc.)

To detect the tape end, a quick sensor consisting of an LED and a photocell is installed at the left side. This quick sensor is constructed as shown in Fig. 11.

In this construction, the light emitted from the LED strikes the tape through an optical fiber, and the reflection light is directed into the photocell through another optical fiber. When the magnetic section of the tape passes the optical fibers, as the emission light is absorbed, no output of the photocell is obtained. On the other hand, when the non-magnetic opaque white or transparent leader tape section near the tape end passes the optical fibers, as the reflection light from this section or the reflector plate (located after the tape) is input to the photocell (Fig. 11 shows the case of the transparent type), the output of the photocell starts. This output is input to the controller for various applications such as auto-stop, auto-reverse, repeat play, etc. (The controller already knows which side of the tape is the tape end by checking the mode code pattern output.)

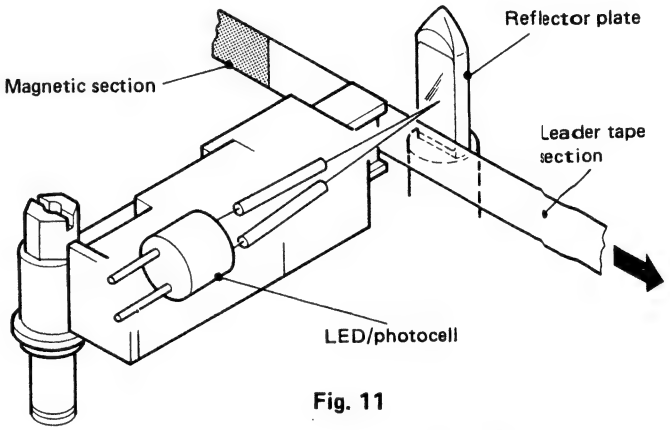


Fig. 11

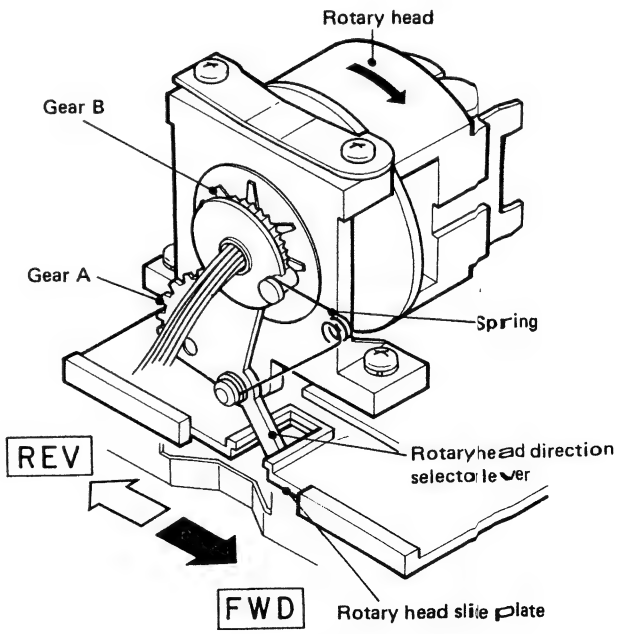
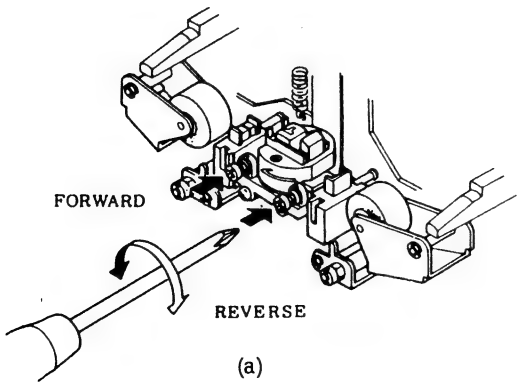


Fig. 12

ADJUSTMENT

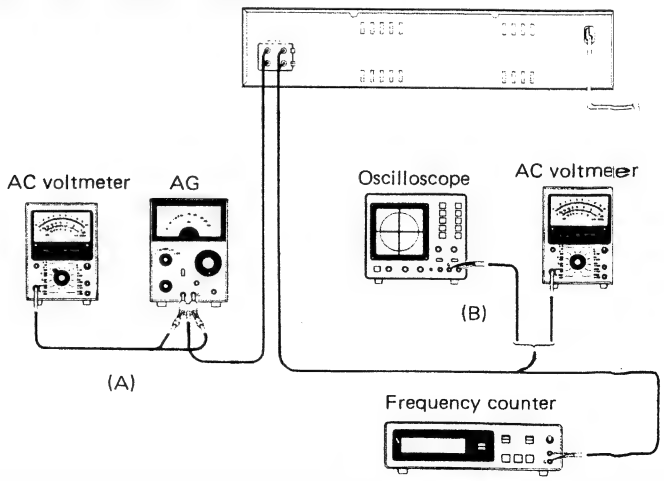
No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	CASSETTE TAPE DECK SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
CASSETTE DECK SECTION		TAPE: NORMAL, DOLBY: OFF, INPUT: LINE, OUTPUT/PHONES LEVEL: MAX				0dBs=0.775V	
I REC/PLAY HEAD							
[1]	DEMAGNETIZATION	–	–	POWER: OFF Remove the cassette door.	REC/PLAY head	Demagnetize the REC/PLAY head with a head demagnetizer.	
[2]	CLEANING	–	–	POWER: OFF Remove the cassette door.	REC/PLAY head erase head, capstan, pinch roller.	Clean the REC/PLAY head erase head, capstan and pinch roller using a cotton swab slightly damped with alcohol.	
[3]	AZIMUTH	MTT-256 10kHz, -20dB	(B)	PLAY	Azimuth adjustment screw	Adjust the azimuth adjustment screw so that the output voltage is maximized in both forward and reverse direction.	(a)
II DC MOTOR							
(i)	TAPE SPEED	MTT-111 MTT-111D	(B)	PLAY	Trimming potentiometer in the DC motor	Adjust the tape speed so that a 3kHz signal is produced at the center of the tape.	
III PC BOARD							
<1>	PLAYBACK LEVEL	MTT-256 315Hz, 0dB	(B)	PLAY	VR3 (L) VR4 (R)	Output level: -6.0dBs (390mV)	
<2>	BIAS CURRENT	(A) 1kHz, -30dBs 10kHz, -30dBs	(B)	Adjust REC and BALANCE so that the REC monitor output becomes -26dBs at 1kHz, then record and reproduce signal of 1kHz and 10kHz in alternation.	VR7 (L) VR8 (R)	Record 1kHz and 10kHz in alternation and adjust the variable resistors which control the bias current so that the same playback level is obtained.	
<3>	RECORD LEVEL	(A) 1kHz, -30dBs	(B)	Record and reproduce a 1kHz signal under the conditions set in <2>.	VR5 (L) VR6 (R)	Adjust the variable resistors so that a playback level of -26dBs (39mV) is obtained.	

AZIMUTH ADJUSTMENT SCREW



(a)

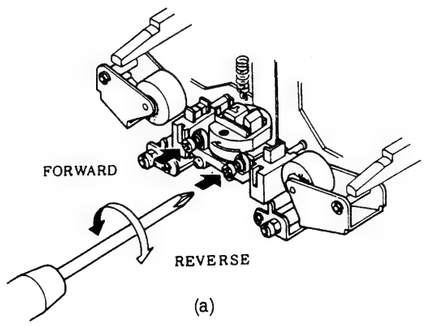
SYSTEM CONNECTIONS



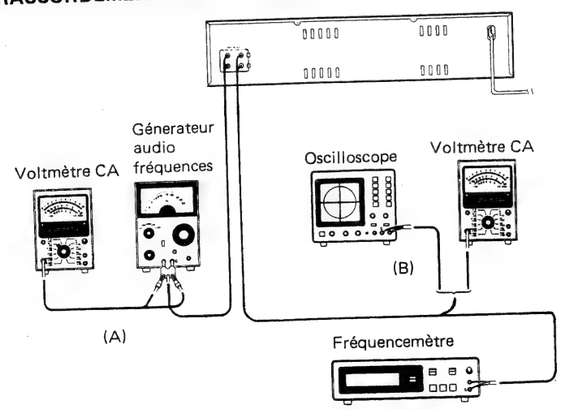
REGLAGE

N°	ITEM	REGLAGE DE L'ENTREE	REGLAGE DE LA SORTIE	REGLAGE DU MAGNETO -PHONE A CASSETTE	POINTS DE L'ALIGNEMENT	ALIGNER POUR / 0dBs=0,775V	FIG.
SECTION DU MAGNETOPHONE		TAPE: NORMAL, DOLBY: OFF, INPUT: LINE, OUTPUT/PHONES LEVEL: MAX					
I TETE D'ENREGISTREMENT/LECTURE							
[1]	DEMAGNETISATION	—	—	POWER: OFF Eloigner la porte.	Tête D'ENREGISTREMENT/ LECTURE	Demagnétiser la tête D'ENREGISTREMENT/LECTURE avec un démagnétiseur de tête.	
[2]	NETTOYAGE	—	—	POWER: OFF Eloigner la porte.	Tête D'ENREGISTREMENT/ LECTURE tête d'effacement, cabestan, galetpresseur.	Nettoyer la tête D'ENREGISTREMENT/LECTURE la tête d'effacement, le cabestan et le galetpresseur avec un coton-tige légèrement imbibé d'alcool.	
[3]	AZIMUT	MTT-256 10kHz. -20dB	(B)	PLAY	Vis d'azimut	Ajuster la vis de réglage de l'azimut de façon que la tension de sortie soit maximale à la fois en avant et en arrière, de la bande d'essai.	(a)
II MOTEUR CC							
(i)	VITESSE DE DEFILEMENT	MTT-111 MTT-111D	(B)	PLAY	Résistance ajustable du moteur CC	Régler la vitesse de bande de façon qu'un signal de 3kHz soit produit au centre de la bande.	
III PLAQUE IMPRIMEE							
<1>	NIVEAU DE LECTURE	MTT-256 315Hz. 0dB	(B)	PLAY	VR3 (G) VR4 (D)	Niveau de sortie: -6.0dBs (390mV)	
<2>	COURANT DE POLARISATION	(A) 1kHz. -30dBs 10kHz. -30dBs	(B)	Régler REC et BALANCE de façon que la sortie de moniteur REC soit de -26dBs à 1kHz, puis enregistrer et reproduire des signaux de 1kHz et 10kHz en alternance.	VR7 (G) VR8 (D)	Enregistrer un signal de 1kHz et 10kHz en alternance et ajuster les résistances variables qui commandent le courant de polarité de façon à obtenir le même niveau de lecture.	
<3>	NIVEAU D'ENREGISTREMENT	(A) 1kHz. -30dBs	(B)	Enregistrer et reproduire un signal de 1kHz dans les conditions précisées en <2>.	VR5 (G) VR6 (D)	Ajuster les résistances variables de façon à obtenir un niveau de lecture de -26dBs(39mV).	

VIS D'AZIMUT



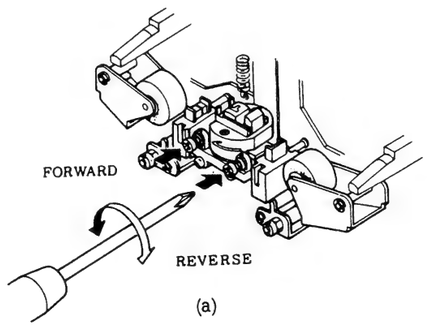
RACCORDEMENTS DU SYSTEME



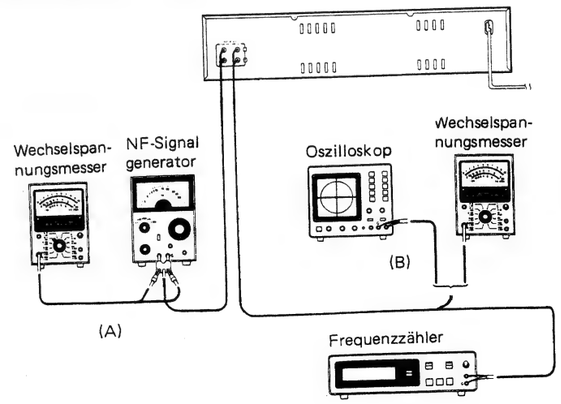
ABGLEICH

NR.	GEGENSTAND	EINGANGS-EINSTELLUNG	AUSGANGS-EINSTELLUNG	KASSETTENGERÄT-EINSTELLUNG	ABGLEICH PUNKTE	ABGLEICHEN FÜR / 0dBs=0,775V	ABB.
CASSETTEN-DECK-ABTEILUNG		TAPE: NORMAL, DOLBY: OFF, INPUT: LINE, OUTPUT/PHONES LEVEL: MAX					
I AUFNAHME/WIEDERGABE-KOPF							
[1]	ENTMAGNETI-SIERUNG	—	—	POWER: OFF Den Kassettenfach deckel oben herausziehen.	AUFNAHME/ WIEDERGABE-Kopf	Entmagnetisierung von dem AUFNAHME/WIEDERGABE-Kopf mit einem Tonkopf Entmagnetisierungsdrossel.	
[2]	REINIGUNG	—	—	POWER: OFF Den Kassettenfach deckel oben herausziehen.	AUFNAHME/ WIEDERGABE-Kopf Löschkopf, Tonwelle, Andruckrolle.	AUFNAHME/WIEDERGABE-Kopf, Löschkopf, Tonwelle und Andruckrolle mit einem leicht mit Alkohol befeuch teten Wattebausch reinigen.	
[3]	AZIMUT-EINSTELLUNG	MTT-256 10kHz. -20dB	(B)	PLAY	Azimut-Einstellschraube	Die Azimut-Justierschraube so einstellen,daß die maximale Ausgangsspannung in Vorwärts-Reverserichtung und erzielt.	(a)
II GLEICHSTROMMOTOR							
(i)	BANDGESCH-WINDIGKEIT	MTT-111 MTT-111D	(B)	PLAY	Trimmer poten-tiometer am Gleichstrommotor	Die Bandgeschwindigkeit so justieren, daß ein 3kHz Signal auf der Mitte des Bands erzeugt wird.	
III GEDRUCKTE SCHALTPLATTE							
<1>	WIEDERGABE-PEGEL	MTT-256 315Hz. 0dB	(B)	PLAY	VR3 (L) VR4 (R)	Ausgangspegel: -6.0dBs (390mV)	
<2>	LEERLAUFSTROM	(A) 1kHz. -30dBs 10kHz. -30dBs	(B)	REC und BALANCE so justieren, daß der REC Monitorausgang -26dBs bei 1kHz wird, und danach abwechselnd Signale von 1kHz und 10kHz aufnehmen und wiedergeben.	VR7 (L) VR8 (R)	Signale von 1kHz und 10kHz abwechselnd aufnehmen und die Regelwiderstände, die den Vormagnetisierugsstrom regeln, so justieren, daß der gleiche Wiedergabepegel erzielt wird.	
<3>	AUFNAHMEPEGEL	(A) 1kHz. -30dBs	(B)	Ein 1kHz Signal unter den in Punkt <2> beschriebenen Bedingungen aufnehmen und reproduzieren.	VR5 (L) VR6 (R)	Die Regelwiderstände so justieren, daß ein wiedergabepegel von -26dBs(39mV)erzielt wird.	

AZIMUTH-EINSTELLSCHRAUBE

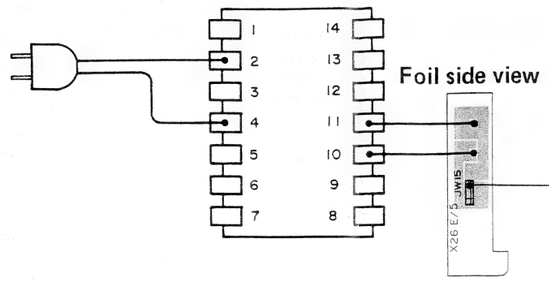


SYSTEM-ANSCHLUSSE



PC BOARD

Refer to the schematic diagram for the values of resistors and capacitors.
The PC board drawing is viewing from the side easy to check.



IC 1			
1	4.4V	21	2.1V
2	1.3V	22	—
3	1.3V	23	—
4	1.3V	24	—
5	1.3V	25	—
6	1.2V	26	—
7	1.2V	27	—
8	1.2V	28	4.8V(0V)
9	0V(1.2V)	29	4.8V(0V)
10	0V(4.8V)	30	0V(4V)
11	0V(4.8V)	31	4.7V
12	0V(4.8V)	32	3V(0V)
13	0V(4.8V)	33	0V
14	4.8V(0V)	34	4.9V
15	0V(4.8V)	35	4.9V
16	4.8V	36	0V
17	4.8V	37	0V
18	0V	38	0V
19	2.2V	39	0V
20	4.9V	40	0V

IC 2			
1	0.2V	12	—
2	0.2V	13	4.3V
3	3.7V	14	4.8V
4	4.6V	15	0V(4.9V)
5	1.9V	16	4.8V(0V)
6	3.0V	17	—
7	3.0V	18	4.7V
8	3.0V	19	0.2V
9	3.0V	20	0.2V
10	0V	21	0.2V
11	0V	22	0.2V

IC 3			
1	3.7V	9	0V
2	0.2V	10	17V
3	0.2V	11	17V
4	0.2V	12	17V
5	0.2V	13	17V
6	0.2V	14	17V
7	0.2V	15	17V
8	0V	16	0V

MECHA. ASS'Y (D40-0317-05)

IC 4		
7	13.6V	
8		

IC 5		
7	14.3V	
8	9.8V	

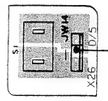
IC 6	
1	1.3V
2	0.77V
3	3.4V
4	12.0V
5	0V
6	3.4V
7	0.77V
8	1.3V

IC 7, 8	
1	7.5V
2	7.5V
3	7.5V
4	0V
5	7.5V
6	7.5V
7	7.5V
8	15V

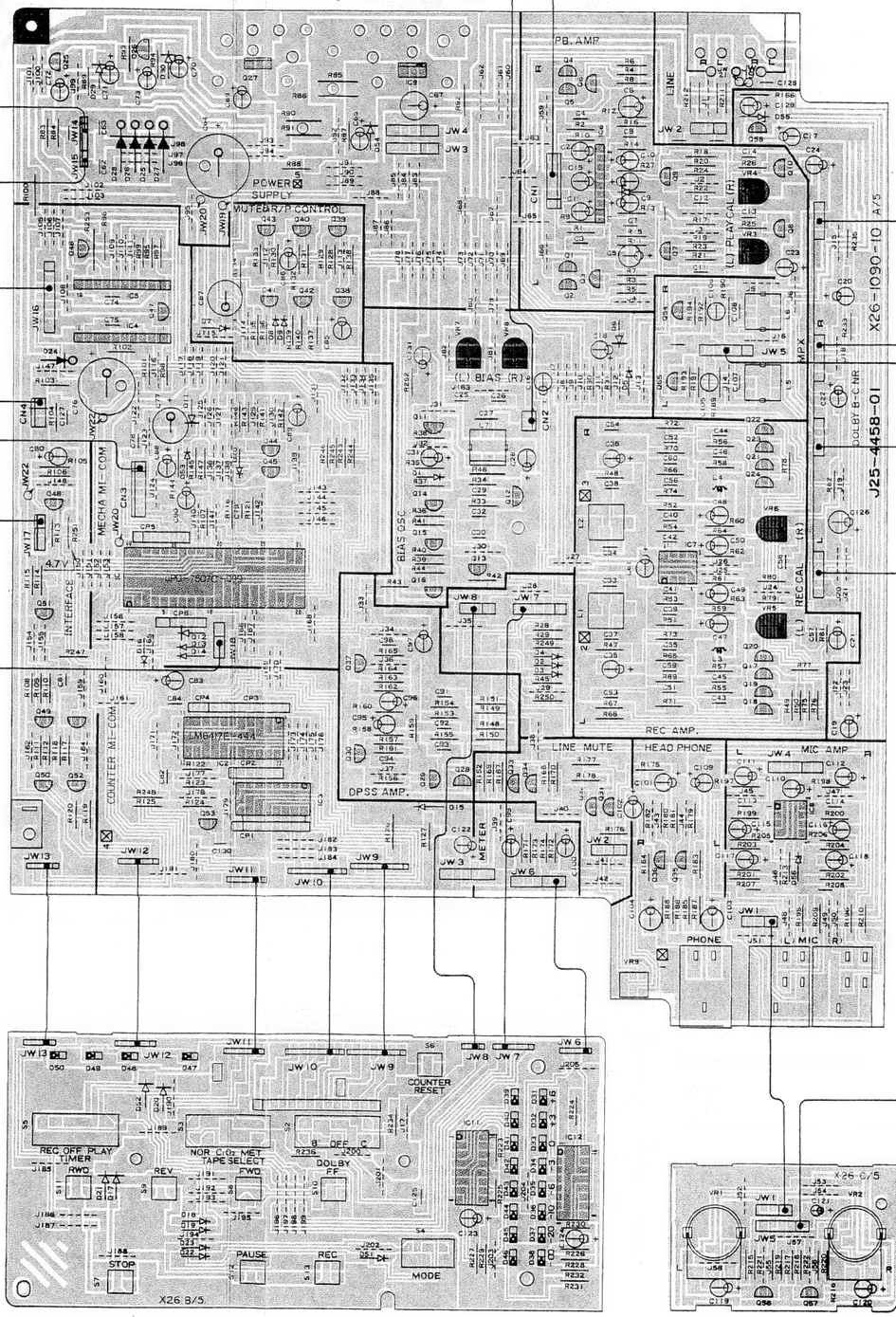
IC 9	
IN	—
OUT	15.0V
GND	0V

IC 11, 12	
1	9.8
2	11.5V
3	13V
4	11.5V
5	13V
6	11.5V
7	13V
8	0V
9	0.6V
10	15V
11	0V
12	0V
13	0V
14	2.6V
15	0V
16	0.7V

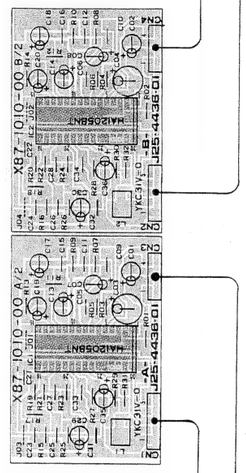
	B	C	E
Q11	—	15V	N : 5.2V C : 6.7V M : 11.3V
Q25	—	—	15.2V
Q26	—	—	5.6V
Q27	0V	—	14.3V
Q46	3.6V	14.1V	3.0V
Q47	0.6V	0V	0V
Q49	—	0V(2V)	0V
Q50	—	2V(0V)	0V
Q51	—	4.7V	0V
Q52	3.7V	3.1V	14.2V
Q53		4.3V(0V)	0V
Q56	5.2V	12.2V	4.6V
Q57	5.2V	12.2V	4.6V



CASSETTE UNIT (X26-1090-10) Component side view



DOLBY UNIT (X87-1010-00)
Component side view



IC 1, 2			
1	12.2V	16	6.0V
2	6.0V	17	6.1V
3	6.1V	18	6.1V
4	0V	19	6.1V
5	3.7V	20	6.1V
6	6.1V	21	1V(2V)
7	6.2V	22	0.7V
8	6.2V	23	6.3V
9	6.1V	24	6.4V
10	6.1V	25	6.4V
11	0V	26	6.4V
12	0.9V	27	—
13	0.6V	28	—
14	0V	29	0V(4.3V)
15	5.4V	30	OFF 4.5V B 6.1V C 8.1V

IC1	:μPD7507C-099	Q1~6,35,36	: 2SC1845(F,E)
IC2	:LM6417E-444	Q7~10, 13~25,28~32,43~57	: 2SC1740S(Q,R), 2SC945(A)(Q,P) or 2SC2320(E,F)
IC3	:BA6251	Q11,12,26	: 2SD863(E,F) or 2SC2060(Q,R)
IC4,5	:BA6109	Q27	: 2SD882(Q,P)*1
IC6	:μPC1228HA	Q33,34	: 2SC2878 or 2SD1302(R,S)
IC7,8	:AN6556	Q37,39~42	: 2SA933S(Q,P) or 2SA733(A)(Q,P)
IC9	:μPC78M15H*1	Q38	: 2SA999(E,F)
IC11,12	:AN6882	Q58	: 2SC2003(L,K)

2SA733
2SA992
2SA999
2SC1845
2SC2003
2SC2060
2SC2320
2SC945
2SD1302
2SD863

2SD882*1

2SA933S
2SC1740S

AN6882
TD62501P

BA6251

AN6556

LM6417E-444

μPC1228HA

- DC voltages are as measured with a high impedance voltmeter with a cassette loaded at playback mode. Values may vary sllightly due to variations between individual instruments or/and units. Bias circuit DC voltages are as measured while in the record mode.

- Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance. une cassette étant insérée en mode du lecture. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels. Les tensions c.c. du circuit de polarité doivent être mesurées. l'appareil étant en mode d'enregistrement.

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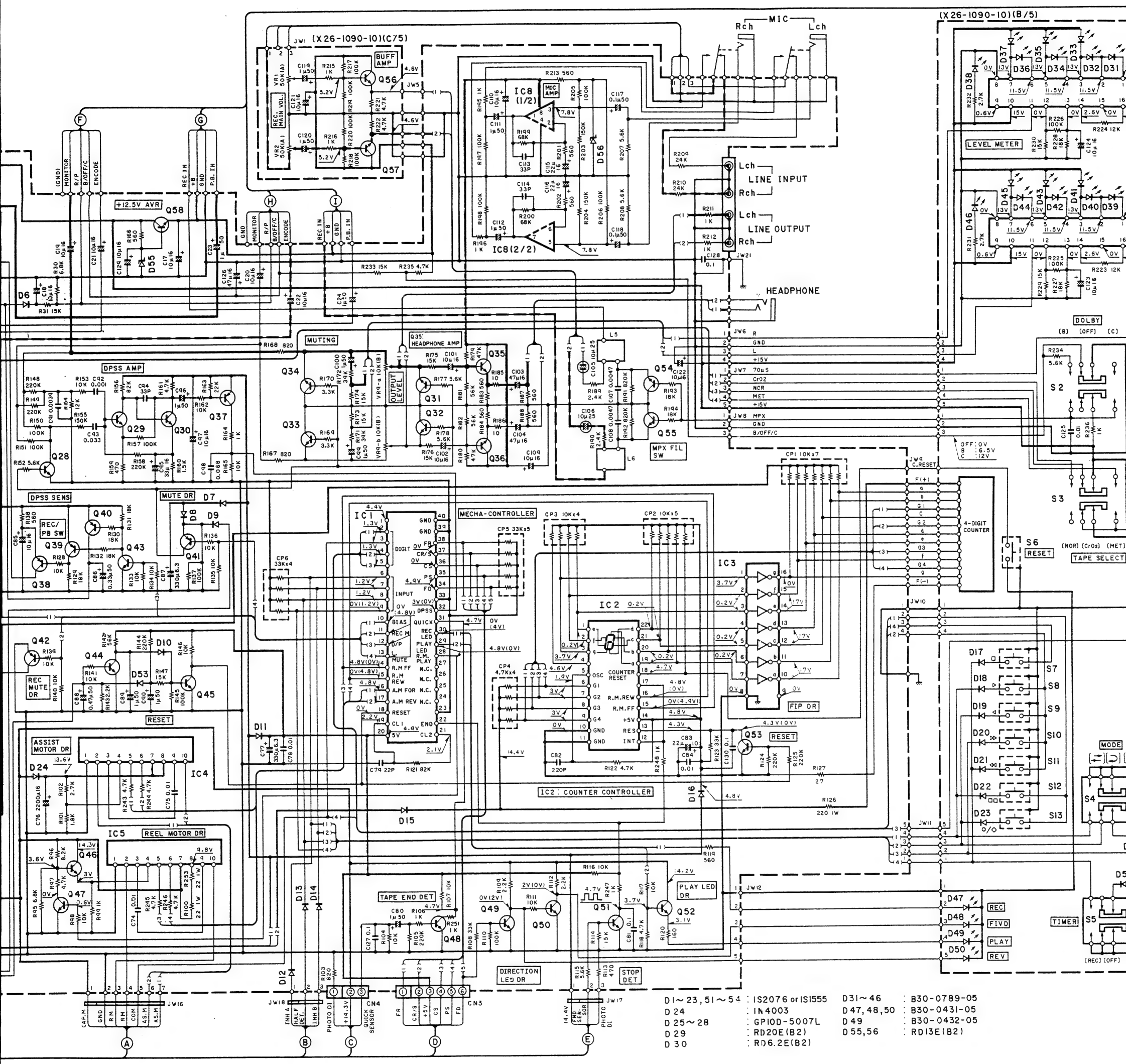
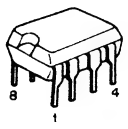
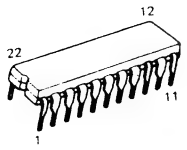


D1~23, 51~54	: IS2076 or IS1555	D31~46	: B30-0789-05
D24	: IN4003	D47, 48, 50	: B30-0431-05
D25~28	: GP10D-5007L	D49	: B30-0432-05
D29	: RD20E(B2)	D55, 56	: RD13E(B2)
D30	: RD6.2E(B2)		

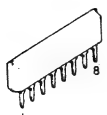
AN6556



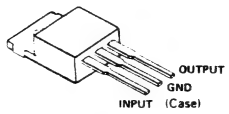
LM6417E-444



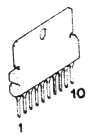
μPC1228HA



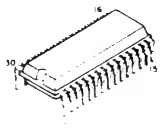
μPC78M15H*1



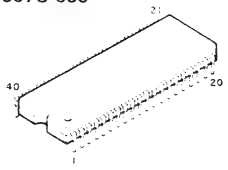
BA6109



HA12058NT



μPD7507C-099

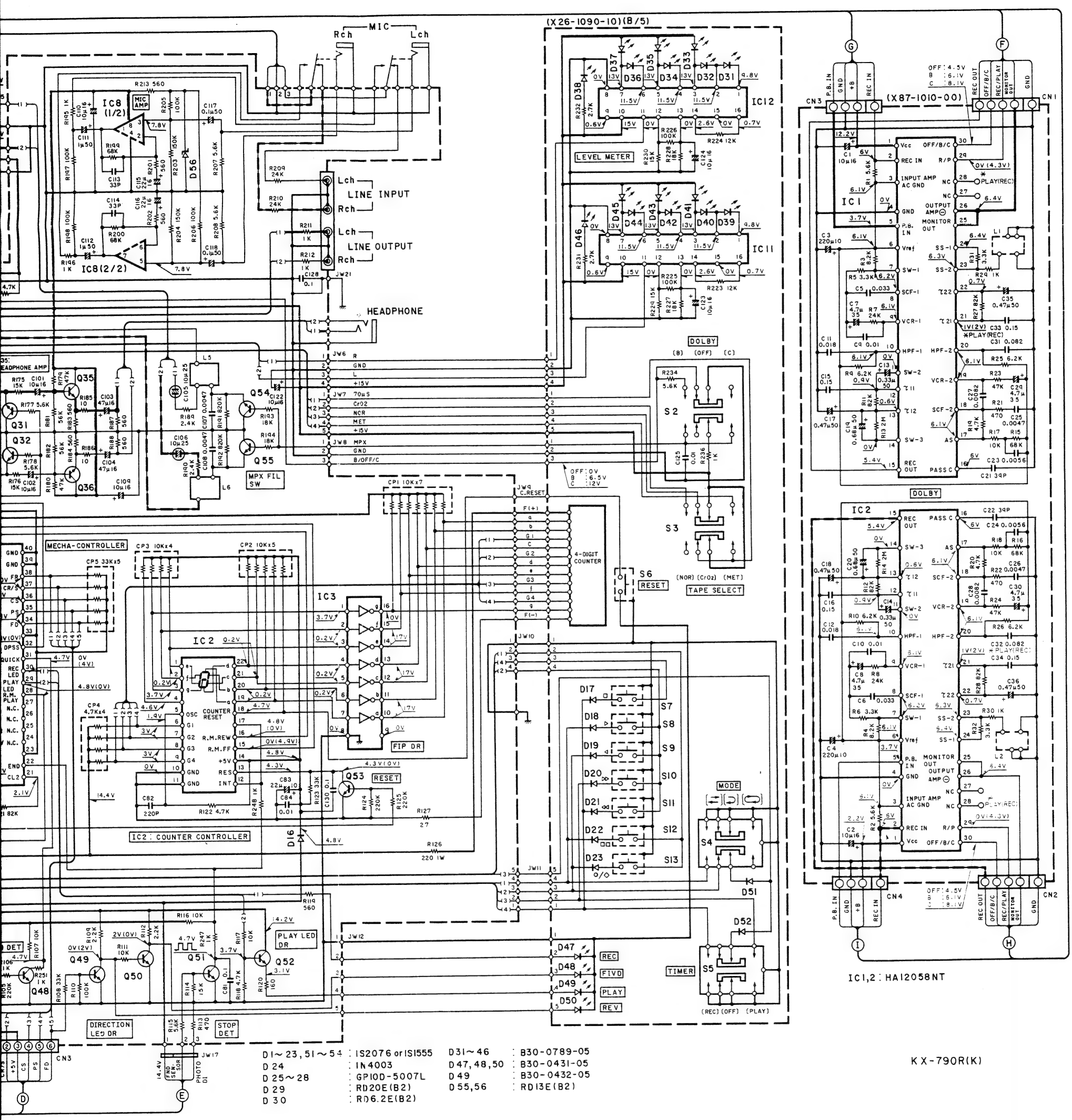


⚠ Indicates safet

- DC voltages are as measured with a high impedance voltmeter with a cassette loaded at playback mode. Values may vary sllightly due to variations between individual instruments or/and units. Bias circuit DC voltages are as measured while in the record mode.

- Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance. une cassette étant insérée en mode du lecture. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels. Les tensions c.c. du circuit de polarité doivent être mesurées. l'appareil étant en mode d'enregistrement.

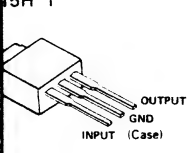
- Die angegeben Gleichspannungswerte wurden bei eingesetzter Cassette in der Wiedergabe mit einem hochohmigen Voltmeter gemessen. Dabei schwanken die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u.U. geringfügig. Die angegeben Gleichspannungswerte der Vormagnetisierungsschaltung wurder in der Aufnahme-Betriebsart gemessen.



D1~23, 51~54 : IS2076 or ISI555
D 24 : IN4003
D 25~28 : GPI0D-5007L
D 29 : RD20E(B2)
D 30 : RD6.2E(B2)
D31~46 : B30-0789-05
D 47, 48, 50 : B30-0431-05
D 49 : B30-0432-05
D 55, 56 : RD13E(B2)

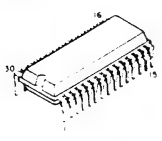
KX-790R(K)

15H*1

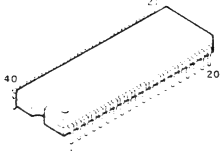


BA6109

HA12058NT

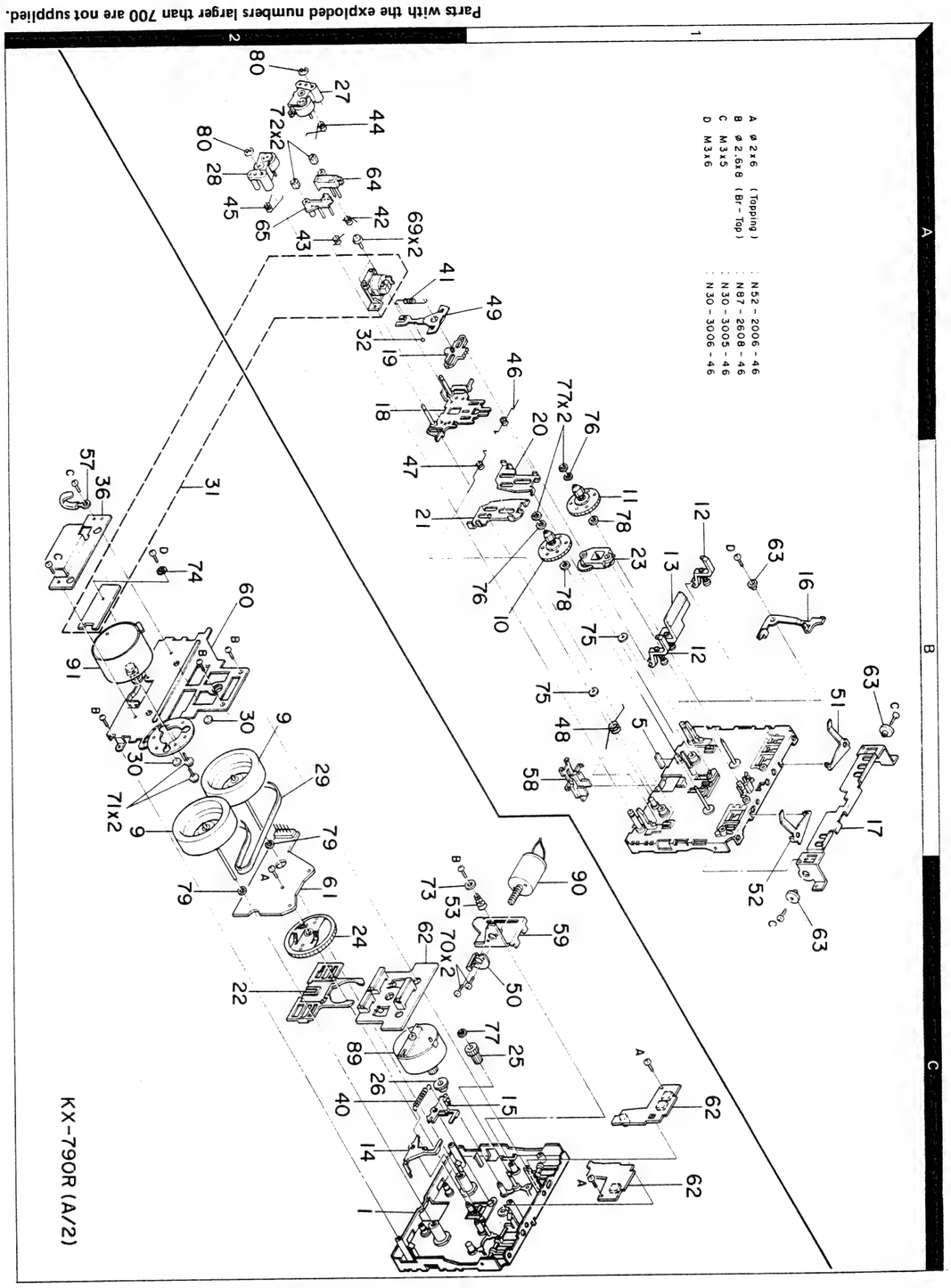


μPD7507C-099

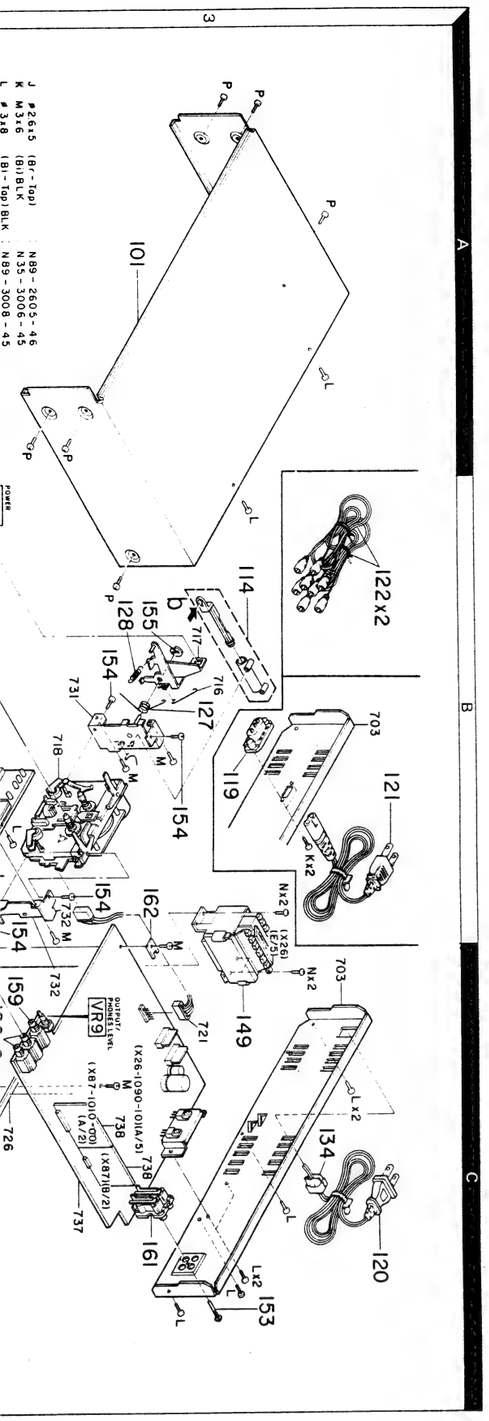


⚠ Indicates safety critical component.

Parts with the exploded numbers larger than 700 are not supplied.



EXPLODED VIEW (MECHANISM)



EXPLO

KX-790R

SETTE DECK

ereo Cassette Deck with Dolby B
no, Recording/Playback/Auto-
cy: 85 kHz)
(4-Track/2-Channel
errite)
ontrolled DC Motor
C Motors
tape

Harmonic Distortion	Less than 1.0% (at 1 kHz, 0 VU with metal tape)
Wow and Flutter	0.05% (W.R.M.S.), ±0.13% (DIN)
Input Sensitivity/Impedance:	
Line x 2	77.5 mV/50 kohms
Microphones x 2	0.3 mV/600 ohms
Output Level/Load Impedance:	
Line x 2	390 mV (0 VU)/50 kohms
Headphones x 1	0.22 mW/8 ohms
Power Requirements	AC 120V, 60 Hz: U.S.A. and Canada Models AC 220 – 240V, 50 Hz: European and Australian Models AC 120V/220-240V (Switchable), 50/60 Hz: Other Countries
Power Consumption	25 watts
Dimensions	W: 440 mm (17-5/16") H: 111 mm (4-3/8") D: 322 mm (12-11/16")
Weight	4.8 kg (10.6 lb)
Supplied Accessories	Audio Connection Cables x 2
Reference Tapes	Normal: KENWOOD ND-60, TDK AD C-60 CrO_2: KENWOOD CD-60, TDK SA C-60 Metal: KENWOOD MD-60, TDK MA C-60

Kenwood follows a policy of continuous advancements in development.
For this reason specifications may be changed without notice.
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Noise reduction circuit made under license from Dolby Laboratories Licensing Corporation.

Kenwood poursuit une politique de progrès constants en ce qui concerne le développement.
Pour cette raison, les spécifications sont sujettes à modifications sans préavis.
La marque DOLBY et le double "D" sont des marques dépo sées des Dolby Laboratories.
Le système de réduction du bruit de fond est fabriqué sous license des Dolby Laboratories.

Kenwood strebt ständige Verbesserungen in der Entwicklung an.
Daher bleiben Änderungen der technischen Daten jederzeit vorbehalten.
DOLBY und Doppel-D-Symbol sind eingetragene Warenzeichen der Dolby Laboratories.
Dolby-Rauschunterdrückung mit Lizenz der Dolby Laboratories gefertigt.

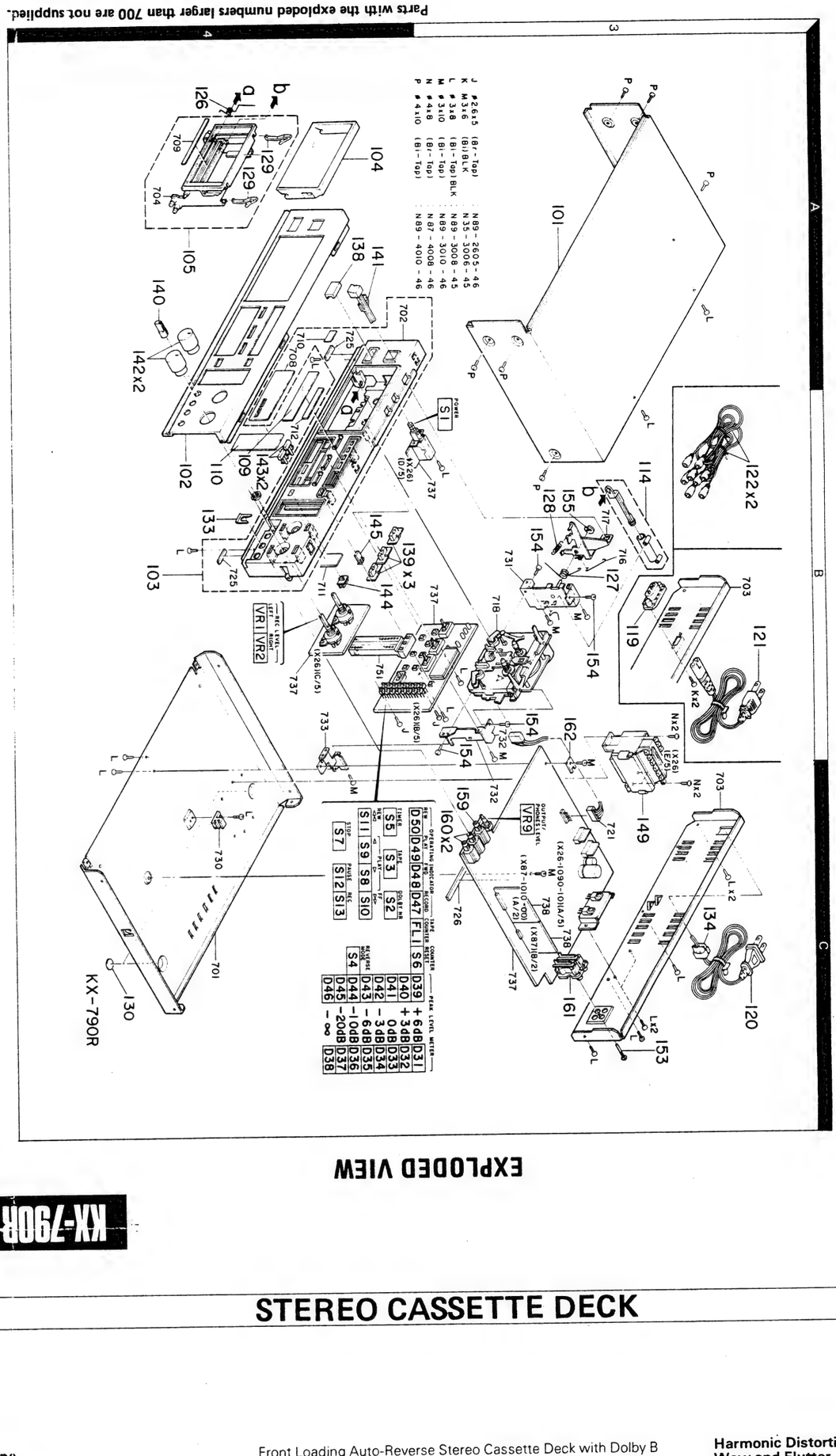
KX-790R / KX-790R

STEREO CASSETTE DECK

Type	Front Loading Auto-Reverse Stereo Cassette Deck with Dolby B and C NR System
Track System	4-Track, 2-Channel Stereo/Mono, Recording/Playback/Auto-reverse in Record and Playback
Recording System	AC Bias System (Bias Frequency: 85 kHz)
Erasing System	AC System
Tape Speed	4.76 cm/sec (1-7/8 ips)
Heads	Record and Playback Head × 1 (4-Track/2-Channel Hard Permalloy Head) Erase Head × 1 (Double Gap Ferrite)
Motors	Capstan Drive: Electronically Controlled DC Motor Reel and mechanism Drives: DC Motors
Fast Winding Time	Approx. 85 seconds with C-60 tape
Frequency Response:	
Normal Tape	20 Hz to 17,000 Hz, ± 3 dB
CrO_2 Tape	20 Hz to 17,000 Hz, ± 3 dB
Metal Tape	20 Hz to 18,000 Hz, ± 3 dB
Signal-to-Noise Ratio:	
Dolby C Type NR ON	74 dB (Metal tape)
Dolby B Type NR ON	67 dB (Metal tape)
Dolby NR OFF	57 dB (Metal tape)
Harmonic Distortion	
Wow and Flutter	
Input Sensitivity/Impedance:	
Line × 2	
Microphones × 2	
Output Level/Load Impedance:	
Line × 2	
Headphones × 1	
Power Requirements	
Power Consumption	
Dimensions	
Weight	
Supplied Accessories	
Reference Tapes	

EXPLODED VIEW

Parts with the exploded numbers larger than 700 are not supplied.



PARTS LIST

KX-790R

Ref. No.	Address	New Parts	部品番号	Parts No.
101	3A	*		A01-1348-02
102	4B	*		A20-4093-02
103	4B	* *		A22-0462-03
104	4A	* *		A53-0626-03
105	4A	*		A53-0627-03
109	4B	*		B08-0036-04
110	4B	*		B08-0037-04
-	-	-		B46-0092-03
-	-	-		B46-0093-03
-	-	-		B46-0094-03
-	-	-		B46-0095-03
-	-	-		B46-0096-03
-	-	* *		B46-0098-03
-	-	* *		B50-5369-00
-	-	*		B50-5370-00
-	-	* *		B50-5371-00
-	-	* *		B50-5422-00
-	-	*		B50-5427-00
-	-			B58-0223-04
-	-			B58-0269-04
-	-			B58-0513-04
-	-			B59-0092-00
114	3B	*		D39-0172-05
119	3B			E03-0102-15
120	3C			E30-0181-05
120	3C			E30-0459-05
120	3C			E30-1341-05
121	3B			E30-1305-15
122	3B			E30-0505-05
126	4A	*		G01-1527-04
127	3B	*		G01-1528-04
128	3B	*		G01-1557-04
129	4A			G02-0123-04
130	4C	*		G11-1103-04
-	-	*		H01-5242-04
-	-	*		H10-1763-04
-	-	*		H10-1764-04
-	-	*		H12-0185-04
-	-			H20-0417-04
-	-			H25-0078-04
-	-			H25-0224-04
-	-			H25-0224-04
-	-			H40-0005-04
133	4B			J21-3326-05
134	3C			J42-0083-05
-				J61-0307-05
138	4A	*		K27-1325-04
139	4B	*		K27-1326-04
140	4A			K29-1327-04
141	4A	*		K29-1853-04
142	4A	*		K29-1854-04

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KENWOOD

STER

Type ..... Front Loadin
and C NR Sy
4-Track, 2-C
reverse in R
Track System .....
Recording System .....
AC Bias Sys
Erasing System .....
AC System
Tape Speed ..... 4.76 cm/se
Heads .....
Record and
Hard Perma
Erase Head
Motors ..... Capstan Dri
Reel and me
Fast Winding Time ..... Approx. 85
Frequency Response:
Normal Tape ..... 20 Hz to 17
CrO_2 Tape ..... 20 Hz to 17
Metal Tape ..... 20 Hz to 18
Signal-to-Noise Ratio:
Dolby C Type NR ON ..... 74 dB (Met
Dolby B Type NR ON ..... 67 dB (Met
Dolby NR OFF ..... 57 dB (Met

KX-790R KX-790R

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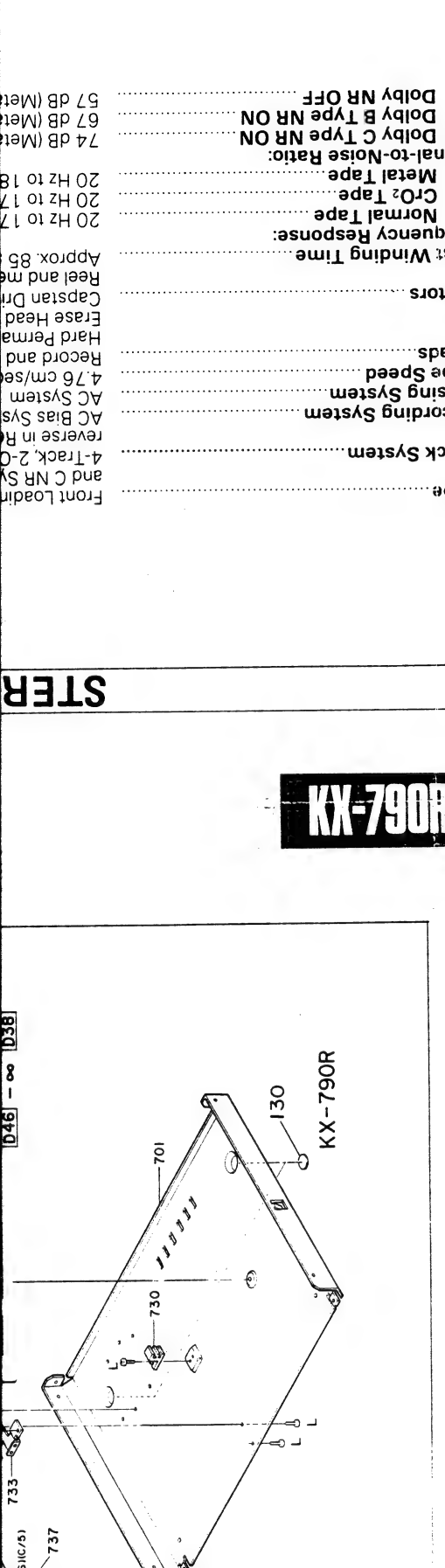
			KX-790R			
101	3A	*	A01-1348-02	METALLIC CABINET		
102	4B	*	A20-4093-02	PANEL		
103	4B	*	A22-0462-03	SUB PANEL ASSY		
104	4A	*	A53-0626-03	CASSETTE LID		
105	4A	*	A53-0627-03	CASSETTE HOLDER ASSY		
109	4B	*	B08-0036-04	INDICATOR(OP IND,TAPE COUNTER)		
110	4B	*	B08-0037-04	INDICATOR(PEAK LEVEL METER)		
-			B46-0092-03	WARRANTY CARD	K	
-			B46-0093-03	WARRANTY CARD	P	
-			B46-0094-03	WARRANTY CARD	UUE	
-			B46-0095-03	WARRANTY CARD	UUE	
-			B46-0096-03	WARRANTY CARD	X	
-			B46-0098-03	WARRANTY CARD	E	
-		*	B50-5369-00	INSTRUCTION MANUAL(ENGLISH)		
-		*	B50-5370-00	INSTRUCTION MANUAL(FRENCH)	PMXE	
-		*	B50-5371-00	INSTRUCTION MANUAL(SPANISH)	M	
-		*	B50-5422-00	INSTRUCTION MANUAL(G,D,I)	E	
-		*	B50-5427-00	INSTRUCTION MANUAL(ARABIC)	M	
-			B58-0223-04	CAUTION CARD	U	
-			B58-0269-04	CAUTION CARD	K	
-			B58-0513-04	CAUTION CARD	UE	
-			B59-0092-00	SERVICE DIRECTORY	UUE	
114	3B	*	D39-0172-05	DAMPER ASSY		
⚠ 119	3B		E03-0102-15	AC INLET	UMUE	
⚠ 120	3C		E30-0181-05	AC POWER CORD	KP	
⚠ 120	3C		E30-0459-05	AC POWER CORD	E	
⚠ 120	3C		E30-1341-05	AC POWER CORD	X	
⚠ 121	3B		E30-1305-15	AC POWER CORD (INLET)	UMUE	
122	3B		E30-0505-05	AUDIO CORD		
126	4A	*	G01-1527-04	TORSION COIL SPRING (C HOLDER)		
127	3B	*	G01-1528-04	TORSION COIL SPRING (LOCK PLT)		
128	3B	*	G01-1557-04	EXTENSION SPRING (LOCK PLT)		
129	4A		G02-0123-04	FLAT SPRING (CASSETTE HOLDER)		
130	4C	*	G11-1103-04	CUSHION (UNDER CHASSIS)		
-		*	H01-5242-04	ITEM CARTON CASE		
-		*	H10-1763-04	POLYSTYRENE FOAMED FIXTURE		
-		*	H10-1764-04	POLYSTYRENE FORMED FIXTURE		
-		*	H12-0185-04	PACKING FIXTURE		
-			H20-0417-04	PROTECTION COVER	M	
-			H25-0078-04	PROTECTION BAG		
-			H25-0224-04	PROTECTION BAG	KPUUE	
-			H25-0224-04	PROTECTION BAG	XE	
-			H40-0005-04	RUST PREVENTING PAPER	M	
133	4B		J21-3326-05	JACK MOUNTING HARDWARE		
⚠ 134	3C		J42-0083-05	POWER CORD BUSHING	KPXE	
-			J61-0307-05	WIRE BAND		
138	4A	*	K27-1325-04	KNOB (BUTTON) POWER		
139	4B	*	K27-1326-04	KNOB (LEVER) TIMER,TAPE,DOLBY		
140	4A		K29-1327-04	KNOB OUTPUT/PHONE LEVEL		
141	4A	*	K29-1853-04	KNOB (BTN) EJECT		
142	4A	*	K29-1854-04	KNOB REC LEVEL		



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143	4B	*	K29-1855-04	KNOB (BTN) PAUSE,REC		
144	4B	*	K29-1856-04	KNOB (LVR) REVERSE MODE		
145	4B	*	K29-1940-04	KNOB (BTN) COUNTER RESET		
149	3C	*	L01-3844-05	POWER TRANSFORMER		
153	3C		N09-0301-05	STEPPED SCREW (GND)		
154	3B,3C		N09-1337-05	TAPTITE SCREW (MOUNT HARDWARE)		
155	3B		N29-0207-04	RETAINING RING(LOCK PLATE)		
CASSETTE (X26-1090-10)						
D31 -46	4C		B30-0789-05	LED(LN245RP) LEVEL METER		
D47 ,48	4C		B30-0431-05	LED(LN21CPH) RECORD,FWD		
D49	4C		B30-0432-05	LED(LN31GCPH(U))PLAY		
D50	4C		B30-0431-05	LED(LN21CPH) REV		
C1 ,2			CE04FW1H2R2MEL	ELECTRO 2.2UF 50WV		
C3 ,4			CQ09FS1H821JZS	POLYSTY 820PF J		
C5 ,6			CE04FW1A101MEL	ELECTRO 100UF 10WV		
C7 ,8			CF92FV1H822J	MF 8200PF J		
C9 ,10			CE04FW1V4R7MEL	ELECTRO 4.7UF 35WV		
C11 ,12			CF92FV1H183J	MF 0.018UF J		
C13 ,14			CK45FB1H471K	CERAMIC 470PF K		
C15			CE04FW1C330MEL	ELECTRO 33UF 16WV		
C16 -22			CE04FW1C100MEL	ELECTRO 10UF 16WV		
C23 ,24			CE04FW1H010MEL	ELECTRO 1.0UF 50WV		
C25 ,26			CC45FSL1H101J	CERAMIC 100PF J		
C27			C91-0348-05	POLYPRO 0.0027UF 630WV		
C28			CE04FW1C100MEL	ELECTRO 10UF 16WV		
C29			CF92FV1H223J	MF 0.022UF J		
C30			CF92FV1H103J	MF 0.010UF J		
C31			CE04FW1H3R3MEL	ELECTRO 3.3UF 50WV		
C32			CF92FV1H272J	MF 2700PF J		
C33 ,34			CC45FSL1H151J	CERAMIC 150PF J		
C35 ,36			CE04FW1C100MEL	ELECTRO 10UF 16WV		
C37 ,38			CK45FB1H471K	CERAMIC 470PF K		
C39 ,40			CC45FSL1H470J	CERAMIC 47PF J		
C41 ,42			CF92FV1H124J	MF 0.12UF J		
C43 ,44			CQ09FS1H391JZS	POLYSTY 390PF J		
C45 ,46			CF92FV1H302J	MF 3000PF J		
C47 -50			CE04FW1C100MEL	ELECTRO 10UF 16WV		
C51 ,52			CF92FV1H682J	MF 6800PF J		
C53 ,54			CF92FV1H272J	MF 2700PF J		
C55 ,56			CF92FV1H562J	MF 5600PF J		
C57 ,58			CF92FV1H822J	MF 8200PF J		
C59 ,60			CQ09FS1H821JZS	POLYSTY 820PF J		
C61			CE04FW1C100MEL	ELECTRO 10UF 16WV		
C62 ,63			CK45FF1H103Z	CERAMIC 0.01UF Z		
C64			CE04W1V222MEL	ELECTRO 2200UF 35WV		
C65			CE04FW1V100MEL	ELECTRO 10UF 35WV		
C67			CE04FW1C101MEL	ELECTRO 100UF 16WV		
C69 ,70			CE04FW1C100MEL	ELECTRO 10UF 16WV		
C71 ,72			CE04FW1E100MEL	ELECTRO 10UF 25WV		
C73			CE04FW1C100MEL	ELECTRO 10UF 16WV		
C74 ,75			CK45FF1H103Z	CERAMIC 0.01UF Z		
C76			CE04W1C222MEL	ELECTRO 2200UF 16WV		
C77		*	CE04FW0J331MEL	ELECTRO 330UF 6.3WV		

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Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
C78			CK45FF1H103Z	CERAMIC 0.01UF Z		
C79			CC45FSL1H220J	CERAMIC 22PF J		
C80			CE04FW1H010MEL	ELECTRO 1.0UF 50WV		
C81			C91-0700-05	CERAMIC 0.1UF J		
C82			CC45FSL1H221J	CERAMIC 220PF J		
C83			CE04FW1A220MEL	ELECTRO 22UF 10WV		
C84			CK45FF1H103Z	CERAMIC 0.01UF Z		
C85			CE04FW1C100MEL	ELECTRO 10UF 16WV		
C86			CE04FW1HR33MEL	ELECTRO 0.33UF 50WV		
C87		*	CE04FW0J331MEL	ELECTRO 330UF 6.3WV		
C88			CE04FW1HR47MEL	ELECTRO 0.47UF 50WV		
C89 ,90			CE04FW1H010MEL	ELECTRO 1.0UF 50WV		
C91			CF92FV1H392J	MF 3900PF J		
C92			CF92FV1H102J	MF 1000PF J		
C93			CF92FV1H333J	MF 0.033UF J		
C94			CC45FSL1H330J	CERAMIC 33PF J		
C95			CE04FW1C330MEL	ELECTRO 33UF 16WV		
C96			CE04FW1H010MEL	ELECTRO 1.0UF 50WV		
C97			CE04FW1C100MEL	ELECTRO 10UF 16WV		
C98			CF92FV1H683J	MF 0.068UF J		
C99 ,100			CE04FW1H010MEL	ELECTRO 1.0UF 50WV		
C101,102			CE04FW1C100MEL	ELECTRO 10UF 16WV		
C103,104			CE04FW1C470MEL	ELECTRO 47UF 16WV		
C105,106			CE04HW1E100M	NP-ELEC 10UF 25WV		
C107,108			CF92FV1H472J	MF 4700PF J		
C109,110			CE04FW1C100MEL	ELECTRO 10UF 16WV		
C111,112			CE04FW1H010MEL	ELECTRO 1.0UF 50WV		
C113,114			CC45FSL1H330J	CERAMIC 33PF J		
C115,116			CE04FW1C220MEL	ELECTRO 22UF 16WV		
C117,118			CE04FW1H0R1MEL	ELECTRO 0.1UF 50WV		
C119,120			CE04FW1H010MEL	ELECTRO 1.0UF 50WV		
C121		*	CE04JW1C100MEL	ELECTRO 10UF 16WV		
C122-124			CE04FW1C100MEL	ELECTRO 10UF 16WV		
C125			CK45FF1H103Z	CERAMIC 0.01UF Z		
C126			CE04FW1C470MEL	ELECTRO 47UF 16WV		
C127,128			C91-0700-05	CERAMIC 0.1UF J		
C129			CE04FW1C100MEL	ELECTRO 10UF 16WV		
C130			C91-0700-05	CERAMIC 0.1UF J		
C131			CE04FW1C470MEL	ELECTRO 47UF 16WV		
159	3C		E11-0104-15	PHONE JACK (HEADPHONE)		
160	3C	*	E11-0151-05	PHONE JACK (MIC)		
161	3C		E13-0445-05	PHONO JACK (LINE IN/OUT)		
162	3B		E23-0125-05	TERMINAL (GND PLATE)		
L1 ,2			L39-0312-05	VARIABLE INDUCTOR(BIAS TRAP)		
L3 ,4		*	L40-2238-29	SMALL FIXED INDUCTOR (0.022H)		
L5 ,6			L79-0196-05	LC FILTER (BSF) 85KHZ		
L7			L32-0285-05	BIAS OSCILATING COIL		
CP1			R90-0234-05	MULTI-COMP 10KX7 J		
CP2			R90-0228-05	MULTI-COMP 10KX5 J		
CP3			R90-0233-05	MULTI-COMP 10KX4 J		
CP4		*	R90-0286-05	MULTI-COMP 4.7KX4 J		
CP5			R90-0236-05	MULTI-COMP 33KX5 J		
CP6			R90-0277-05	MULTI-COMP 33KX4 J		
R46			R92-0219-05	FUSE RESIST 10 1/4W		

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Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
R85 ,86		*	RS14KB3A471J	FL-PROOF RS 470 J 1W		
R90 ,91			RS14KB3A220J	FL-PROOF RS 22 J 1W		
R92			RD14GB2E121J	FL-PROOF RD 120 J 1/4W		
R93			RS14KB3A101J	FL-PROOF RS 100 J 1W		
R100		*	RS14KB3A220J	FL-PROOF RS 22 J 1W		
R126			RS14KB3A221J	FL-PROOF RS 220 J 1W		
R253			RS14KB3A220J	FL-PROOF RS 22 J 1W		
VR1 ,2	4B	*	RD1-4031-05	POTENTIOMETER(REC LEVEL)		
VR3 -6		*	R12-3313-05	TRIMMING POT.(20K)PB REC LEVEL		
VR7 ,8		*	R12-5310-05	TRIMMING POT.(200K)BIAS		
VR9	3C	*	R10-3023-05	POTENTIOMETER(OUTPUT/PHONE LVL		
S1		*	S40-1089-05	PUSH SWITCH (POWER)		
S2 ,3		*	S31-2091-05	SLIDE SWITCH(DOLBY NR,TAPE)		
S4			S31-2062-05	SLIDE SWITCH(REVERSE MODE)		
S5		*	S31-2091-05	SLIDE SWITCH(TIMER)		
S6 -13		*	S40-1085-05	PUSH SWITCH (C RESET,OP KEY)		
D1 -23			1S1555	DIODE		
D1 -23			1S2076	DIODE		
D24			1N4003	DIODE		
D25 -28			GP10D-5007L	DIODE		
D29			RD20E(B2)	ZENER DIODE		
D30			RD6.2E(B2)	ZENER DIODE		
D51 -54			1S1555	DIODE		
D51 -54			1S2076	DIODE		
D55 ,56			RD13E(B2)	ZENER DIODE		
D57			RD5.1E(B2)	ZENER DIODE		
FL1		*	4-ST-41ZYK	FLUORESCENT INDICATOR TUBE		
IC1		*	UPD7507C-099	IC(MICROPROCESSOR)		
IC2		*	LM6417E-444	IC(MICROPROCESSOR)		
IC3		*	BA6251	IC(7-CH TRANSISTOR ARRAY)		
IC3		*	TD62501P	IC(7-CH TRANSISTOR ARRAY)		
IC4 ,5		*	BA6109	IC(MOTOR DRIVER)		
IC6			UPC1228HA	IC(TAPE EQ AMP)		
IC7 ,8			AN6556	IC(OP AMP)		
IC9			UPC78M15H*1	IC(VOLTAGE REGULATOR) +15V		
IC11,12			AN6882	IC(METER DRIVER)		
Q1 -6			2SC1845(F,E)	TRANSISTOR		
Q7 -10			2SC1740S(Q,R)	TRANSISTOR		
Q7 -10			2SC2320(E,F)	TRANSISTOR		
Q7 -10			2SC945(A)(Q,P)	TRANSISTOR		
Q11 ,12			2SC2060(Q,R)	TRANSISTOR		
Q11 ,12			2SD863	TRANSISTOR		
Q13 -25			2SC1740S(Q,R)	TRANSISTOR		
Q13 -25			2SC2320(E,F)	TRANSISTOR		
Q13 -25			2SC945(A)(Q,P)	TRANSISTOR		
Q26			2SC2060(Q,R)	TRANSISTOR		
Q26			2SD863	TRANSISTOR		
Q27			2SD882*1(Q,P)	TRANSISTOR		
Q28 -32			2SC1740S(Q,R)	TRANSISTOR		
Q28 -32			2SC2320(E,F)	TRANSISTOR		
Q28 -32			2SC945(A)(Q,P)	TRANSISTOR		
Q33 ,34			2SD1302(S)	TRANSISTOR		
Q35 ,36			2SC1845(F,E)	TRANSISTOR		
Q37			2SA733(A)(Q,P)	TRANSISTOR		

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Q37			2SA933S(Q,R)	TRANSISTOR		
Q37			2SA999(E,F)	TRANSISTOR		
Q38			2SA992(F,E)	TRANSISTOR		
Q39 -42			2SA733(A)(Q,P)	TRANSISTOR		
Q39 -42			2SA933S(Q,R)	TRANSISTOR		
Q39 -42			2SA999(E,F)	TRANSISTOR		
Q43 -57			2SC1740S(Q,R)	TRANSISTOR		
Q43 -57			2SC2320(E,F)	TRANSISTOR		
Q43 -57			2SC945(A)(Q,P)	TRANSISTOR		
Q58			2SC2003(L,K)	TRANSISTOR		
DOLBY NR (X87-1010-00)						
C1 ,2			CE04FW1C100MEL	ELECTRO 10UF 16WV		
C3 ,4			CE04FW1A221MEL	ELECTRO 220UF 10WV		
C5 ,6			CF92FV1H333J	MF 0.033UF J		
C7 ,8			CE04FW1V4R7MEL	ELECTRO 4.7UF 35WV		
C9 ,10			CF92FV1H103J	MF 0.010UF J		
C11 ,12			CF92FV1H183J	MF 0.018UF J		
C13 ,14			CE04FW1HR33MEL	ELECTRO 0.33UF 50WV		
C15 ,16			CF92FV1H154J	MF 0.15UF J		
C17 ,18			CE04FW1HR47MEL	ELECTRO 0.47UF 50WV		
C19 ,20		*	CE04GW1HR68MEL	LL-ELEC 0.68UF 50WV		
C21 ,22			CC45FSL1H390J	CERAMIC 39PF J		
C23 ,24			CF92FV1H562J	MF 5600PF J		
C25 ,26			CF92FV1H472J	MF 4700PF J		
C27 ,28			CF92FV1H822J	MF 8200PF J		
C29 ,30			CE04FW1V4R7MEL	ELECTRO 4.7UF 35WV		
C31 ,32		*	CF92FV1H823J	MF 0.082UF J		
C33 ,34			CF92FV1H154J	MF 0.15UF J		
C35 ,36			CE04FW1HR47MEL	ELECTRO 0.47UF 50WV		
L1 ,2			L39-0106-05	TRAP COIL (20KHZ)		
IC1 ,2		*	HA12058NT	IC(DOLBY)		
CASSETTE MECHANISM (D40-0317-05)						
1	2C		A10-0774-08	CHASSIS ASSY		
5	1B		B19-0349-08	MIRROR		
9	2B		D01-0063-08	FLYWHEEL ASSY		
10	1B		D03-0231-08	REEL DISK ASSY (R)		
11	1B		D03-0232-08	REEL DISK ASSY (L)		
12	1B		D10-1352-08	LEVER ASSY (REC DETECT)		
13	1B		D10-1353-08	LEVER ASSY (CASSETTE-IN DET)		
14	2C		D10-1354-08	LEVER ASSY (BRAKE L)		
15	1C		D10-1355-08	LEVER ASSY (BRAKE R)		
16	1B		D10-1356-08	ARM (EJECT PREVENT L)		
17	1C		D10-1357-08	ARM (DETECTION)		
18	1A		D10-1358-08	SLIDER (PLATE HEAD)		
19	1A		D10-1359-08	SLIDER (C/R SLIDE PLATE)		
20	1A		D10-1360-08	SLIDER (SLIDE BASE L)		
21	1B		D10-1361-08	SLIDER (SLIDE BASE R)		
22	2C		D10-1362-08	SLIDER (SWITCHOVER)		
23	1B		D13-0197-08	GEAR ASSY (IDLER ASSY)		
24	2C		D13-0198-08	GEAR ASSY		
25	1C		D13-0199-08	GEAR (WORM)		
26	2C		D13-0200-08	GEAR (IDLE)		

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27	2A		D14-0117-08	PINCH ROLLER ASSY (L)		
28	2A		D14-0118-08	PINCH ROLLER ASSY (R)		
29	2B		D16-0110-08	BELT (MAIN)		
30	2B		D23-0197-08	RETAINER (FLYWHEEL)		
31	2A,2B		D40-0327-08	MECHANISM ASSY (COMBI HEAD)		
32	2A		D90-0025-08	STEEL BALL		
-			E31-3513-08	CONNECTING WIRE (REC/PLAY)		
-			E31-3514-08	CONNECTING WIRE (ERASE)		
-			E31-3515-08	CONNECTING WIRE (TAPE SENSOR)		
36	2B		F10-0551-08	SHIELDING PLATE (PCB)		
40	2C		G01-1579-08	TENSION SPRING (BRAKE)		
41	2A		G01-1580-08	TENSION SPRING (CR SLIDE)		
42	2A		G01-1581-08	TORSION SPRING (ADJ L)		
43	2A		G01-1582-08	TORSION SPRING (ADJ R)		
44	2A		G01-1583-08	TORSION SPRING (PNCH ROLLER L)		
45	2A		G01-1584-08	TORSION SPRING (PNCH ROLLER R)		
46	1A		G01-1585-08	TORSION SPRING (SLIDE BASE L)		
47	2B		G01-1586-08	TORSION SPRING (SLIDE BASE R)		
48	1B		G01-1587-08	TORSION SPRING (HEAD BASE)		
49	1A		G02-0177-08	FLAT SPRING (CR SLIDE PLATE)		
50	1C		G02-0178-08	FLAT SPRING (THRUST)		
51	1B		G02-0179-08	FLAT SPRING (CASSETTE PACK L)		
52	1C		G02-0180-08	FLAT SPRING (CASSETTE PACK R)		
53	2C		G02-0181-08	SPIRAL SPRING		
57	2B		J19-0306-05	HOLDER (WIRE)		
58	1B		J19-2188-08	HOLDER (HEAD LEAD)		
59	1C		J21-3562-08	MOUNTING HARDWARE (ASSIST MTR)		
60	2B		J21-3563-08	MOUNTING HARDWARE (MAIN MTR)		
61	2C		J25-4501-08	PRINTED WIRING BOARD (DETECT)		
62	1C		J25-4502-08	PRINTED WIRING BOARD (CONNECT)		
63	1B,1C		J39-0084-08	SPACER (COLLAR)		
64	2A		J90-0151-08	TAPE GUIDE (WITH SENSOR)		
65	2A		J90-0152-08	TAPE GUIDE		
69	2A		N09-1433-08	SCREW (M2X5)		
70	1C		N09-1434-08	SCREW (M2X3.5)		
71	2B		N09-1435-08	SCREW (M2.6X3.5)		
72	2A		N14-0150-08	NUT		
73	2C		N15-1026-46	FLAT WASHER		
74	2B		N17-1030-46	TOOTHED LOCK WASHER		
75	1B		N19-0369-04	FLAT WASHER (ø2.5)		
76	1B		N19-0524-04	FLAT WASHER (ø2X3.8X0.25)		
77	1B,1C		N19-0903-08	FLAT WASHER (ø1.6X3.8X0.25)		
78	1B		N19-0904-08	FLAT WASHER (ø2.1Xø7X0.13)		
79	2B,2C		N19-0905-08	FLAT WASHER (ø2.6X0.25)		
80	2A		N24-3025-45	E TYPE RETAINING RING		
89	2C		T42-0058-08	DC MOTOR ASSY (REEL)		
90	1C		T42-0059-08	DC MOTOR ASSY (ASSIST)		
91	2B		T42-0060-08	DC MOTOR ASSY (MAIN)		
-			T34-0311-08	REC/PLAY HEAD		

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KX-790R

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28	2A		D14-0118-08	PINCH ROLLER ASSY (R)		
29	2B		D16-0110-08	BELT (MAIN)		
30	2B		D23-0197-08	RETAINER (FLYWHEEL)		
31	2A,2B		D40-0327-08	MECHANISM ASSY (COMBI HEAD)		
32	2A		D90-0025-08	STEEL BALL		
-			E31-3513-08	CONNECTING WIRE (REC/PLAY)		
-			E31-3514-08	CONNECTING WIRE (ERASE)		
-			E31-3515-08	CONNECTING WIRE (TAPE SENSOR)		
36	2B		F10-0551-08	SHIELDING PLATE (PCB)		
40	2C		G01-1579-08	TENSION SPRING (BRAKE)		
41	2A		G01-1580-08	TENSION SPRING (CR SLIDE)		
42	2A		G01-1581-08	TORSION SPRING (ADJ L)		
43	2A		G01-1582-08	TORSION SPRING (ADJ R)		
44	2A		G01-1583-08	TORSION SPRING (PNCH ROLLER L)		
45	2A		G01-1584-08	TORSION SPRING (PNCH ROLLER R)		
46	1A		G01-1585-08	TORSION SPRING (SLIDE BASE L)		
47	2B		G01-1586-08	TORSION SPRING (SLIDE BASE R)		
48	1B		G01-1587-08	TORSION SPRING (HEAD BASE)		
49	1A		G02-0177-08	FLAT SPRING (CR SLIDE PLATE)		
50	1C		G02-0178-08	FLAT SPRING (THRUST)		
51	1B		G02-0179-08	FLAT SPRING (CASSETTE PACK L)		
52	1C		G02-0180-08	FLAT SPRING (CASSETTE PACK R)		
53	2C		G02-0181-08	SPIRAL SPRING		
57	2B		J19-0306-05	HOLDER (WIRE)		
58	1B		J19-2188-08	HOLDER (HEAD LEAD)		
59	1C		J21-3562-08	MOUNTING HARDWARE (ASSIST MTR)		
60	2B		J21-3563-08	MOUNTING HARDWARE (MAIN MTR)		
61	2C		J25-4501-08	PRINTED WIRING BOARD (DETECT)		
62	1C		J25-4502-08	PRINTED WIRING BOARD (CONNECT)		
63	1B,1C		J39-0084-08	SPACER (COLLAR)		
64	2A		J90-0151-08	TAPE GUIDE (WITH SENSOR)		
65	2A		J90-0152-08	TAPE GUIDE		
69	2A		N09-1433-08	SCREW (M2X5)		
70	1C		N09-1434-08	SCREW (M2X3.5)		
71	2B		N09-1435-08	SCREW (M2.6X3.5)		
72	2A		N14-0150-08	NUT		
73	2C		N15-1026-46	FLAT WASHER		
74	2B		N17-1030-46	TOOTHED LOCK WASHER		
75	1B		N19-0369-04	FLAT WASHER (ø2.5)		
76	1B		N19-0524-04	FLAT WASHER (ø2X3.8X0.25)		
77	1B,1C		N19-0903-08	FLAT WASHER (ø1.6X3.8X0.25)		
78	1B		N19-0904-08	FLAT WASHER (ø2.1XøX0.13)		
79	2B,2C		N19-0905-08	FLAT WASHER (ø2.6X0.25)		
80	2A		N24-3025-45	E TYPE RETAINING RING		
89	2C		T42-0058-08	DC MOTOR ASSY (REEL)		
90	1C		T42-0059-08	DC MOTOR ASSY (ASSIST)		
91	2B		T42-0060-08	DC MOTOR ASSY (MAIN)		
-			T34-0311-08	REC/PLAY HEAD		

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